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4 January 1984

# Worldwide Report

TELECOMMUNICATIONS POLICY,  
RESEARCH AND DEVELOPMENT

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4 January 1984

# WORLDWIDE REPORT

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# DETAILS ON VIDEOTEX CAPABILITIES, IMPACT REPORTED

## Ramifications of System

Sydney THE SYDNEY MORNING HERALD in English 22 Oct 83 p 15

[Article by Jack Taylor]

[Text]

A few unions woke up this week to what they perceive to be one of the more ominous threats that 1984 might have in store for them.

The awakening followed the long-awaited announcement by the Government that Telecom had been given approval to set up a national videotex network by late next year.

Videotex?

It is a simple-to-use communications facility linking a visual display unit, which may be an adapted television, to the telephone and then to a national network of computers and data banks.

To big business it could represent, in the words of one computer specialist, as big an advance as the telephone was on the carrier pigeon.

To domestic users it could mean, within two or three years, a much bigger market opening up to a huge range of goods, services and knowledge. An investment of between \$300 and \$800 will adapt their television, giving access to everything — well, almost everything.

A simple permutation of numbers dialled on the phone will reveal tomorrow's weather forecast, or today's racing results, stock exchange information from Sydney or Singapore, a complete range of products at the local supermarket or the best price for a good used car.

The user will be able to do the shopping, banking, pay bills or book next year's holiday without ever leaving the lounge room.

They will be able to read this story without ever having the paper delivered.

This, of course, is why unions covering bank employees, shop workers, clerks and newspaper employees are beginning to express concern.

The State secretary of the Australian Bank Employees' Association, Mr Dawson Petie, said: "There are 120,000 bank officers in Australia, 70 per cent of whom are in the retail end dealing with the customers.

"Banks like Westpac and ANZ already have their own videotex operations set up and there's no question that banks are aiming to have some money-changing shops where there won't be any people at all.

"It's already having an effect on bank employment overseas, particularly in Britain where videotex has been operational for years.

"The implications of this thing are enormous for bank officers... just like journo's, mate."

In Britain, where videotex was invented and introduced as Prestel in 1979, the system has 30,000 users — not quite the hundreds of thousands predicted by British Telecom originally — although it is growing quickly.

"But there it was more costly and less successful initially than it should have been because of a number of mistakes which won't be repeated in Australia," Mr Petie said.

Mr Bob Easson, business development manager of Control

Data Australia Pty Ltd, said yesterday: "British Telecom's initial target was the consumers and they ignored the business community.

"It was the wrong way around and we won't be making the same mistake here."

Control Data is one of a growing number of companies which already has an operational videotex system.

It claims to have 500 subscribers, including GM-H and Jet-set Tours, both of which operate a closed user network providing up to date business information to their dealers and agents.

The business users—or providers of information—pay between \$2,500 and \$10,000 joining fee, plus \$12 an hour line time while the receivers pay \$100 a year and, usually, a small charge per call.

By next year Control Data, which is investing \$10 million in videotex, will plug its data bank into the national network, along with many other data banks.

Telecom will operate its own data bank but restrict its flow of information to Telecom business, such as its yellow pages telephone guide.

Most of the major media companies are interested in joining the network, although whether they will establish their own data banks or plug into somebody else's is unclear at the moment.

A media organisation, for instance, The Sydney Morning Herald, subscribing to a commercial data bank would pay the joining fee of up to \$10,000 plus a

small fee for every page put into the system.

According to a Telecom spokesman it is expected that the information provider would charge its viewing customers at a rate of eight cents to ten cents a minute to see the material.

Telecom will act as the billing agent for everybody, as well as providing "the gateway" system by which the telephone subscribers can dial into whatever data bank is required.

It is calling for tenders from select companies for the supply of equipment. But since the infrastructure and circuitry already exists, the costs to Telecom will be only \$4 million for a three year period, which is a fraction of a normal week's expenditure.

### Communications Role

Melbourne THE AGE in English 1 Nov 83 p 26

[Article by Jana Pearce]

[Text] The Minister for Communications, Mr Duffy's recent decision to give Telecom the green light to establish a national videotex opens up a new era in electronic communications for Australians.

Videotex, an information and communications system, has been around for a few years; Telecom was raring to go with the service in 1981, but the then Minister for Communications, Mr Sinclair, slammed on the brakes.

Companies such as Computer Power, Control Data (Prestel) ICL (Prestel) Honeywell (Telegel & Teletel), Westpac (purchased Videonet, based on the Canadian Telidon system, from Myers), and Computer Acfo & Accounting Services (Telidon), seeing the potential of the technology have successfully made inroads into the business area providing much needed terminal-linked information services.

Videotex combines three existing technologies: television, the telephone network and the computer.

It is the international name of all interactive, two-way communication systems using computers and generating texts and graphics on television sets and monitors. There are public and private systems.

Within videotex there are competitive systems using different technologies and different protocols (rules which govern its operation). These systems are Prestel, Telidon Captain, Telitel and Naplps.

Telecom will provide a central computer to store information and "gateways" through which subscribers will be able to access private videotex systems run by individual organisations--for example, dealer organisations, doctors, stockbrokers, and legal services.

"Information providers" will be able to buy "space" in Telecom's central computer, and subscribers will be able to access this information through videotex terminals. These terminals can be bought, leased or rented from suppliers. A number of TV manufacturers will provide adapters, which are expected to sell for about \$300. The business videotex terminals retail from \$600.

Any organisation or individual will be able to buy space on the central computer and put information on videotex. The information of the videotex service will be under the direct control of the information providers, who will control the content, frequency of up-dates and the amount of information given.

Subscribers will be able to connect to the videotex service from anywhere in Australia for the cost of a local call, and Telecom estimates a charge of eight cents for each minute.

The charge for the information accessed will depend on the type of information looked at and the "page" price set by the information provider.

The information is accessed through index "pages" displayed on the screen. The user selects the required page numbers by pressing the corresponding numbers on his or her keypad or keyboard.

Mr Paul Budde, director of Paul Budde Communications, recently established a videotex marketing and advice agency in Sydney. He has worked with videotex since 1978, and is a leading consultant on electronic communications.

Mr Budde says that in Germany, five banks are giving their customers home banking videotex

services to perform electronic funds transfer and the payments of accounts.

"The banks' customers have taken to the service like ducks to water," he said. "The demand by far exceeds the present facilities of the banks."

Mr Budde said that German consumer reports on videotex banking show the greatest benefit of the system is the customer's ability to control their own private accounts.

The emerging role of videotex as a vital communications medium requires initiative from a number of sources. A large involvement will be required from private enterprise, which will be responsible not only for the provision of information on the service, but also for supplying the terminals and TV adapters.

The French Teletel-based videotex service is marketed in Australia by Honeywell. The Paris-based software house Steria and Honeywell, signed a licencing agreement earlier this year for Steria's videotex software system, Videopac, which runs the French Teletel service.

Honeywell's director of marketing Mr Derrick Evans, believes Australia is on the brink of the videotex revolution — a revolution which could in a few years significantly affect the share of Australian society.

"By opening up access to information, of all kinds, to vast numbers of Australian users, videotex could change working patterns, alter the face of consumerism and offer vastly enhanced leisure opportunities," Mr Evans said.

"Honeywell is well placed to take the lead in providing complete videotex services throughout Australasia and expects to install at least two systems with over 1000 terminals before the

end of the year," he said.

Telecom is starting the national videotex system based on the Prestel standard, however Telecom will support the other videotex standards as soon as the technology is developed enabling the standards to be linked.

"The Australian Federation of Travel Agents' decision to use the French standard, Teletel, for its videotex network sent shockwaves through the videotex sector," Mr Budde said.

"This shows the necessity for a national standard, otherwise future videotex users will need several terminals to access all the services."

"At the moment there is no technology developed to enable one terminal to access all types of videotex systems, however there is the promise that such a system will be developed within the next four years," he said.

Control Data, a dominant supplier of videotex services in Australia, operates Prestel-based Cybertel, a national public access videotex service for the business community.

The company's videotex customers include Jetset Tours, which has started a travel service on Cybertel for its 300 agents: General Motors-Holden's which has a closed user-group application, and Australian International Finance Corporation, the merchant bank of the ANZ group, offers "Money View" on Cybertel, allowing clients of the bank to use information about such areas as interest areas, currency exchange and security hedge rates.

#### Utilization by Business

Sydney THE AUSTRALIAN in English 2 Nov 83 p 22

[Article by Helen Meredith]

[Text] Videotex. What is it? And where does it fit into Australia's plans for becoming part of the information age?

Videotex is a simple communications facility linking a television or visual display unit to the telephone and then to a network of computers and data banks.

For the past couple of years networks such as CompuServe and the Source in the United States, Telidon in Canada, Teletel in France, and Prestel in the UK have offered subscribers a large amount of information and many programs over their telephone lines.

A subscriber can use the network for casual information-gathering at home, or can use it for more serious applications, such as collecting programs from a central data-base. Prestel, for example, holds a library of educational software. Subscribers can gain access to these by dialling into British Telecom's giant Prestel computer and can then "download" or transfer the program from the central data base to his or her own computer.

To big business, videotex can represent ready access to a range of up-to-date information, giving an extra weapon in winning commercial advantage.

To the domestic user it can mean that for an investment of a few hundred dollars to adapt a TV, they can have access to services such as weather reports, sports, stock exchange reports, goods, entertainment, travel, news and banking.

Services such as Prestel have existed in Europe since 1978. In the UK, where videotex had its origins, there are now some 30,000 Prestel users. Prestel was followed by networks in other countries in the region, including West Germany and Holland.

In Australia, it is all just beginning, with network operators determined not to repeat the mistakes made overseas.

Initially it was thought videotex would find its niche in the mass consumer market; but the experience in both Europe and North America has proved otherwise. Penetration of the business community has in the end offered the most secure prospect and network operators in Australia have taken their lead and are directing their marketing at the commercial arena.

### Network

Control Data Australia, which has an operational videotex system, claims to have 500 users, including some big companies, such as GM-H and Jetset Tours. Next year its \$10 million investment in videotex will take on new life as it plugs into the national network along with other data banks.

Computer manufacturer, ICL Australia, also has its own closed user-group network,

and Australian Consolidated Industries runs a service called Ausinet which, like CSIRO's Csironet, provides subscribers with information from a number of databases including one of the world's largest, Orbit.

Last year Myer Communications launched an information-transfer service called Infoquest giving access to Dialog, a huge data base owned by Lockheed which contains more than 40 million abstracts and reference works in a total of 132 separate data bases.

The Federal Government has now given approval to Telecom to set up a national videotex network by the end of next year.

Telecom will operate its own database within the network, but restrict it to such Telecom business as the Yellow Pages phone directory.

Most of the big media companies are said to be keen to join up with the national network, with Telecom as the billing agent for all the information providers to the network, as well as providing the infrastructure and circuitry already in existence so that subscribers can dial into whatever data base they need.

Whatever videotex systems are used, there are still problems where large data bases are involved. Recent surveys

overseas have shown that even regular users of Prestel, for example, are not particularly successful at tracking down the exact information they want. Typically, the user has to hunt through the data base, probably accessing half a dozen pages before finding what he wants.

The slow start in Australia may turn out to be to our advantage as we see that other service, teletext, just starting to make an appearance.

Standardisation will be the key.

GOVERNMENT CRITICIZED FOR SHALLOW HIGH-TECH APPROACH

Sydney THE AUSTRALIAN in English 1 Nov 83 p 19

[Article by Harry Douglas]

[Text]

I AM still amazed at the amateurish approach towards the development of new technology by a Federal Government that has been attempting to display anxiety — quite properly — to get Australia involved in the high-technology industry.

The Federal Government appears to be in the final stages of making some difficult decisions on the Aussat satellite.

The first conclusions — which are imminent — will be over the ownership and control of Aussat, and within the next week or so decisions on the use of its high-power transponders will follow.

These decisions involve flow-on implications for Australian telecommunications and broadcasting far beyond the immediate issues.

The first lesson to be learned from the new high-technology industry is that it has fundamentally changed — and improved out of all recognition — the processes of management and management decision making.

There appears to have been no recognition of this in the Government's own approach towards these major issues on broadcasting and telecommunications.

Pragmatic government is all

very well, but it ceases to be practical and becomes highly dangerous, and even potentially disastrous, if the basic facts are not established and the future implications examined, or at least recognised.

Some months ago I urged the establishment of an independent body in Australia such as the FCC in America, or the CRTC in Canada, which could take an overview of the important broadcasting and telecommunications issues and integrate and co-ordinate policies on an overall basis.

Instead, we have seen these issues being thrown to caucus committees to advise the Government.

I am not arguing against proper consultation within the Government. I support it.

What seems odd is that one of these subcommittees should conduct a pseudo-inquiry or examination with submissions and oral evidence taken in such an old-fashioned way that it cannot possibly probe in depth and with expertise and authority the major implications of any expediency decisions that may be taken.

The problems raised by Aussat are twofold.

For telecommunications as a whole we have at hand a new technology which will overcome with comparative ease many of the insur-

mountable terrestrial problems existing in a huge country like Australia with extremely difficult weather conditions and terrain.

The long-term future of telecommunications in Australia will depend on proper development of those facilities.

If the Aussat Corp were to be given control of the Aussat satellite it would be inadequate on its own.

If Telecom is given control either directly or through a subsidiary corporation, the satellite's potential must not be permitted to be subservient to existing terrestrial systems.

Planning must be 50 years ahead, not five, and if necessary an extensive examination made of the issues concerned.

The point is that this examination or review of the integration, co-ordination and development of satellite-terrestrial communications should have been conducted before the control decisions were made, and not after.

This also applies to broadcasting.

What appears to be a fairly simple practical matter, for example, of permitting the east coast metropolitan TV networks to use the high-power transponders on Aussat to network their programs across the country to regional areas, and to the outback, contains problems of im-

mense and far-reaching significance.

They would turn the present structure of the local broadcasting system upside down.

The regional commercial TV stations see their own future existence at threat.

Because of technical problems and high costs there is no likelihood that the outback would be fully serviced; the existing broadcasting regulations on time zones and children's viewing times would be ignored; the costs to Government in terms of tax concessions and subsidies could be enormous; the future of subscription TV services in the metropolitan areas would be placed in doubt; and the concentration of media ownership and power would be accentuated.

Instead of providing diversified ownership and a variety of program services there would be a narrowing down of both.

It would also eliminate any chance of introducing new entrants to the broadcasting industry.

This goes totally against the trend of what is happening in other countries.

Yet this is what could happen here if the wrong decisions are made hastily within the next two weeks.

It would be naive to base judgements on uninformed

assumptions that somehow the existing commercial TV networks should be made available to the unsaleable commercial outback market, without realising that by departing from the specifically designed remote-area provisions of the satellite, the costs of receiving equipment in remote areas will be escalated many times and cost the outback audiences some hundreds of millions of dollars extra; that tax concessions will be sought; and that Aussat major earth stations may need last-minute design changes.

Having decided, against opposition, to proceed with the satellite, it would be irresponsible if the Government were to create upheaval in the broadcasting industry merely to ensure the leasing of the high-power transponders to make Aussat viable.

There may, of course, be another reason.

None of the major implications of networking has been subjected to public inquiry, or even to private examination.

Yet it appears that the Government may be prepared to walk backwards into this dangerous minefield.

To do so unawares, would be folly. To do so aware, but without examination, could be a disaster for the country.

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# TELECOM AHEAD IN USE OF SOLAR POWER FOR COMMUNICATIONS

Sydney THE AUSTRALIAN in English 2 Nov 83 p 22

[Text]

SUNLIGHT and light directed down tiny glass fibres are at the heart of the quiet technologies revolutionising communications.

With the recent opening of the 1500km Kimberley microwave trunk line, Telecom demonstrated its world leadership in the use of solar power for communications.

This leadership is recognised in the role of Telecom's research laboratories in evaluating the use of solar cells in the varied environments of Australia.

Working under the aegis of the Australia-Japan agreement on energy research and development, the research laboratories are conducting both field and simulated trials.

The latter trials are the torture chambers of temperature extremes — hail, rain and snow, pollution and dust — designed to measure material capabilities and failures.

On the customer side, Telecom has pioneered the use of solar energy on the Alice Springs-Tennant Creek trunk system, on hundreds of rural properties where the radio telephone is run by the sun, in Glen Valley (Victoria) and Whitecliffs (NSW) where the telephone exchanges are solar powered, and down to a solar public telephone in Tasmania's Lake District.

New trunk systems in Cape York and neighboring islands and the proposed link between Kununurra (WA) and Katherine (NT) will draw their power from the sun.

The next ambitious step is to solve the problem of bringing modern automatic telephony to the remoter areas of Australia. Here people have either had to rely on old party lines, mostly erected by themselves; suffer interference and congestion on radio circuits; or have had no service at all.

Telecom's research laboratories produced an idea that combined digital radio transmission and solar energy to bring the remote areas into the national automatic telephone network.

The first field trial is now being evaluated on a route between Charleville and Cunnamulla in Queensland.

The idea is rather like a miniature microwave trunk system. A route of 500km to 600km is spanned by a series of towers at which signals are received and amplified, sent on down the track, or spurred off to a homestead or small community.

The speech is digitalised to overcome noise and distortion, the plague of direct analogue radio transmissions. The power at the homestead and at the repeater towers is solar.

In this way as many as 100 telephone services may be provided by a digital radio concentrator linked to an automatic telephone exchange, and each service can have STD and ISD as well as telex and videotex facilities.

The other revolution is taking place underground, where aluminium and copper telephone cables are being superseded by cables containing glass fibres.

The tiny strands of glass, not much thicker than human hairs, have a capacity to carry hundreds and thousands of simultaneous telephone calls, or their equivalent in television programs.

# STATE SATELLITE COMMUNICATIONS FIRM WILL NOT GO PUBLIC

Canberra THE AUSTRALIAN in English 15 Nov 83 p 2

[Article by Ian Perkin]

[Text]

THE Federal Minister for Communications, Mr Duffy, is expected to announce today a reversal of the Government's previous decision to sell 49 per cent of Aussat Pty Ltd to private interests.

Cabinet is understood yesterday to have rubber-stamped an earlier decision by its infrastructure committee not to sell the half interest — nor to transfer Aussat control to Telecom.

The decision is effectively a compromise between those in the Cabinet who supported the sale of the 49 per cent interest and those who wanted to see the company taken over by Telecom. Aussat Pty Ltd is the government-owned company set up to control the two domestic communications satellites scheduled to be introduced in Australia.

The Government still has to decide on the all-important issue of the allocation of the transponders on the proposed satellites.

The transponders are the receiving and sending apparatus on the satellites, which will be allocated to the prospective users around the country, such as the major media groups.

It is expected this decision will be made closer to the launching of the first satellite.

Cabinet's move effectively reverses a decision in the May mini-Budget that up to 49 per cent of Aussat Pty Ltd could be sold to private interests.

The decision puts to rest any

chance of Telecom taking over the operation of the domestic satellite — the third option being considered by the Government.

Cabinet's decision to reverse its earlier proposal to sell almost half Aussat's capital to private interests follows lengthy debate in the Government, with all three options having strong support.

## Voted

Its move to maintain the status quo as far as Aussat Pty Ltd is concerned is effectively a compromise arrangement, most likely to placate all views within the party.

Mr Duffy believes Telecom should have control of the domestic satellite, and this view was supported by the Labor Caucus when it voted in July.

Some senior Cabinet members, particularly the Prime Minister, Mr Hawke, the Minister for Industry and Commerce, Senator Button, and the Treasurer, Mr Keating, were against Telecom acquiring control.

The earlier decision to sell up to 49 per cent of the satellite company was partly one of policy — allowing private companies who might be users into its control — and partly a financial consideration.

By allowing in outsiders, the Government would have effectively been cutting in half its own financial contribution to the Aussat program at a time of financial stringency.

It was this that made the potential sale of the 49 per cent interest attractive to some ministers.

## GOVERNMENT DEFEATS MOTION TO SELL PUBLIC TELECOM FIRM

### Private Share Confined to 25 Percent

Melbourne THE AGE in English 16 Nov 83 p 5

[Article by Margot O'Neill]

[Text]

**CANBERRA.**—The Federal Government yesterday narrowly headed off a last minute backbench attempt to overthrow Cabinet's decision to confine Telecom's share of the domestic communications satellite to 25 per cent.

Caucus defeated by 43 to 40 — one of the closest votes this year — a motion to make Telecom the sole owner of the satellite.

The Minister for Communications, Mr Duffy, announced later that the Government had revoked its previous decision to sell to private enterprise nearly half of its satellite company, Aussat. Instead Aussat will remain an independent Government body with 75 per cent held by the Commonwealth and 25 per cent going to Telecom.

Mr Duffy said the Government would introduce new legislation to ensure that Aussat shares could be held only by the Commonwealth and Telecom. It would spell out Aussat's functions and define its jurisdiction in relation to Telecom.

The Government might also introduce legislation to protect specific Telecom services if the need arose, but the Government expected Telecom to lose only "negligible" revenue through the satellite system.

Mr Duffy, who originally fought in Cabinet for 100 per cent Telecom ownership, delivered a strong speech to the Caucus appealing for support for the Cabinet decision.

He was backed by the Treasurer, Mr Keating. The Deputy Prime Minister, Mr Bowen, said in response to suggestions that Caucus might come back to the issue, that the matter had to go through this week.

The proposal to make Telecom the sole owner was moved by a Victorian left-winger, Mr Sanderson, a former official of the Australian Telecommunications Employees Association. But it won wider support than just from the Left.

Mr Sanderson warned that if Telecom did not own Aussat, the company would undercut Telecom's activities. Mr Duffy rejected the argument.

Mr Duffy said that the three commercial television networks were "favorites" to win contracts to lease the much sought after national broadcasting capacity off the satellite system (due for launch in 1985).

"No one else has come forward with a proposition as attractive or as economically viable," he said.

But the final decision now rested with Aussat and would be made on a commercial basis, he said.

To protect the regional stations, Mr Duffy has directed that all commercial television signals from the satellite be broadcast nationally and be encoded or scrambled.

The Government would also move to license the sale and ownership of 'decoders' needed to unscramble the signal. This is to prevent pirate reception of satellite transmissions.

Mr Duffy has directed the Australian Broadcasting Tribunal to hold a public inquiry into regulation needed for commercial broadcasters using the satellite for national broadcasting.

In other decisions the Government has:

- Announced that it will implement the supplementary licence scheme to enable regional broadcasters to establish an extra television or radio station in their area.

- Deferred any decision on whether to introduce a pay-television service until early next year, pending further submissions from the ABC and private enterprise groups.

- Allowed private ownership of satellite 'receive-and-transmit' ground stations while banning the re-sale or re-lease by private enterprise of satellite capacity.

- Rejected the introduction of a domestic cable television service.

Mr Duffy's announcements were welcomed by the chief executive of the Regional Television Association, Mr Ken Stone, who said they were "reassuring for regional stations".

But the Opposition and the key telecommunications union, the Australian Telecommunications Employees Association attacked the decisions as being inconsistent with Labor policy.

### Political, Economic Concerns Viewed

Melbourne THE AGE in English 16 Nov 83 p 15

[News Analysis by Margot O'Neill: "Economics the Key to Decision on Aussat"]

[Text]

CANBERRA. — By opening the way for the commercial television networks to have access to the satellite for national broadcasting, the Minister for Communications, Mr Duffy, has made a decision the former conservative Government could not.

It is ironic that a Labor Government, which has as its policy that "there should be a deliberate creation of as large a diversity of media sources as possible," gave into the demands of the networks. Why it gave in has much to do with the forecast economic viability of Aussat. The Government said if received no viable submissions to use the satellite's broadcast capacity other than from the networks.

The last submission to Cabinet before the election, by the then Communications Minister, Mr Brown, was to deny the network access, instead favoring state-based consortiums of metropolitan and regional telecasters.

The former Government was swayed by intense pressure within its own ranks particularly from the National Party, which in turn reflected concerns among the regional broadcasters keen not to lose their identity.

But then it has taken five Ministers and six years for any decision to be made about the use of the satellite and this Government agonised over the same issues that confronted its predecessor.

The fight between Mr Duffy and the Treasurer, Mr Keating, over whether Aussat should be controlled by Telecom is a re-run of the 1978 disagreement between the then Communications Minister, Mr Staley, and the then Minister for Finance, Mr Robinson.

There was the same contention over whether to sell half of Aussat to private enterprise. Labor in opposition was highly critical when it was decided to dispose of half of the company. How things change: within two months of taking office, Mr Keating announced a decision-in-principle to sell 49 per cent of Government equity in Aussat.

But Caucus rebelled and Mr Keating and his ally in the decision, the Prime Minister, Mr Hawke, were forced to back off. The Government yesterday decided to rescind that decision and to keep Aussat a public company.

It was only after the closest of votes (43-40), and according to Mr Duffy, a persuasive speech by him, that Caucus did not force the Government to reconsider its decision to keep Aussat free of Telecom control.

Throughout the months of lobbying, Mr Duffy, a junior Minister, was under pressure from Mr Keating and Mr Hawke to accommodate the television networks. Despite his preference for Aussat to go to Telecom, which Labor

Party policy supports as the nation's single telecommunications carrier, Mr Duffy was forced to strike a deal that Aussat remain independent, but with Telecom participation.

It must have been a tiresome juggling act for Mr Duffy, who noted in his Cabinet submissions that his proposals were as close to Labor Party policy as possible.

In the long term, the losers have to be Telecom and the regional stations.

## Communications Satellite Details Reported

Melbourne THE AGE in English 16 Nov 83 p 15

[Article by Margot O'Neill]

[Text]

**CANBERRA.** — Australia's domestic satellite system will be like a radio and television transmitter sitting about 36,000 kilometres above the equator.

It will also allow telephone and new technology data services to be distributed throughout the country.

Radio or television stations will send their signals to a relay dish which will transmit the signal up to the satellite. The satellite will then beam the signal down across Australia or to a specified region.

Unlike the existing ground telecommunications links supplied by Telecom, the satellite will have a field of view covering the whole continent. For the first time there will be instant capacity to facilitate a national telecommunications system for radio, television, telephone and data transmissions.

The satellite will have limited impact on cities unless the Government allows a pay television service.

Special ground equipment will be needed to pick up the satellite's signals. The system has two distinct segments: a space segment which relates to the orbiting satellites, and an earth segment, which enables communication signals to be received and sent throughout Australia.

'Earth stations' operate like regular antennae but are dish-shaped to receive satellite signals.

Two satellites will be launched by the United States space shuttle in July and October 1985. Initially, the system will comprise two satellites with an on-ground spare. A third satellite is due to be launched in 1988.

The satellites are being built by Hughes Communications International in America at a cost of \$146 million. They are designed on a 'spinning drum' basis and will be 6.6 metres tall, 2.2 metres in diameter and will weigh 1250 kilograms at launch.

The typical 'life' of a satellite will be about seven years.

The system will have the potential to provide on a national scale:

- Broadcasting of television and radio to all parts of Australia.
- Distribution of signals from commercial and ABC television stations to stations in other locations, aiding program assembly.
- Remote telephone services and use by Telecom for route diversity and back-up capacity during terrestrial failures.
- Communication lines to remote mining operations and off-shore oil rigs.
- Aeronautical communications for the Department of Aviation.
- Data, facsimile, videotex and other services for the Australian business community.
- Improve educational services such as 'School of the Air'.
- Emergency connections in the event of major disaster when terrestrial systems are interrupted.

- Use by other broadcasters such as public broadcasters and pay television services.

Potential users include: remote householders; the three commercial television networks; regional networks; the ABC; the Special Broadcasting Service; the departments of Aviation, Defence and Communications; Telecom; Australian Associated Press; the Public Broadcasting Association of Australia; pay television groups; and other private business groups.

According to Aussat, the Commonwealth satellite company, "The Australian satellite system will improve the overall flexibility, reliability and capacity of the Australian communications system, enabling it to respond to rapidly changing circumstances and to accommodate the special requirements of its users".

CSO: 5500/4355

KAMPUCHEA

## TRIAL TELEVISION BROADCASTS SET FOR 2, 3 DECEMBER

### Broadcast Times Announced

BK010756 Phnom Penh Domestic Service in Cambodian 0430 GMT 1 Dec 83

[Text] Dear compatriots and listeners: Kampuchean television will broadcast its first trial picture transmission from 1830 [1130 GMT] to 3 December. The beam will originate from Phnom Penh of Channel 10. Moreover, in order to make it easier for our teleinspectors to monitor this trial television transmission, a test will be conducted from 1600 [0900 GMT] to 1800 [1100 GMT] on 2 December.

Families with television sets are invited to tune in by adjusting the set's antennae correctly to the new television beam.

### Radio Official Comments

BK040949 Phnom Penh Domestic Service in Cambodian 0430 GMT 4 Dec 83

[Speech by Un Dara, director general of the radio Voice of the Kampuchean People at 3 December meeting to mark the radio's fifth founding anniversary--recorded]

[Excerpt] The technical department's relay station service has studied and set up replay stations in every province, municipality, district, and a number of communes with a total of 28 stations throughout the PRK. Furthermore, through the efforts of the directorate general, in collaboration with the Vietnamese experts, our technicians have assembled the Can Tho municipal television station which started service on 1 August 1980. In 1983 in particular, in accordance with the decisions of the Central Committee and the Council of Ministers, the Voice of the Kampuchean People Radio is striving to establish television for the first time in our country. During this first step, we have sent a number of cadres and personnel to train at the Can Tho television station with satisfactory results.

CSO: 5500/4357

PEOPLE'S REPUBLIC OF CHINA

BRIEFS

CABLE SYSTEM--Hangzhou, 13 December (XINHUA)--China has produced a medium co-axial wave carrier system able to handle 4,380 telephone calls simultaneously, officials here said. Systems built by China previously could handle a maximum of 1,800 calls, officials added. [Text] [OW131238 Beijing XINHUA in English 1223 GMT 13 Dec 83]

CSO: 5500/4154

THAILAND

TV NETWORKS TO BE EXPANDED TO COMBAT INTERFERENCE FROM LAOS, MALAYSIA

BK100515 Bangkok THE NATION REVIEW in English 10 Dec 83 p 3

[Text] The government will next year launch a 3-year programme to improve the television networks nation-wide in a bid to stop interference by television signals from Laos and Malaysia, Minister Chan Manutham said yesterday.

He said under the urgent plan, the government will spend 276 million baht to expand the television networks to cover the whole country. A budget of 40 million baht for the first year of the plan has already been approved, he said.

Chan said the Public Relations Department will under the plan be supported to set up main stations to televise educational TV programmes nation-wide.

Viewers in the South, he said, still cannot fully receive television signals from Thai television stations. Many have to switch to Malaysian TV broadcast instead.

CSO: 5500/4356

## THAILAND

### BRIEFS

INCOMING SATELLITE SYSTEM--According to Chao Thongma, governor of the Communications Authority of Thailand, a satellite communications system will improve domestic communications capability, particularly in the telegram, telex, radio telegraph, transmission of information, and television relay services. Utilization of satellite communications corresponds with the national communications development plan. This plan includes expansion of telex service to other regions and expansion of high frequency radio, two-way radio for use in automobiles, and paging systems to major cities. There is a plan to add 10 telex terminals upcountry every year. This requires installation of complete communications networks. To rely solely on the microwave system would not be sufficient to cope with increasing demands. The use of satellite communications will fully satisfy the demand because Intelsat contains many signal channels. Chao said the implementation of satellite communications will require construction of both master and slave stations. A total of 14 slave stations will be constructed in various regions, such as in Chiang Mai, Phrae, Lampang, Phitsanulok, Nakhon Sawan, Khon Kaen, Surat Thani, Nakhon Si Thammarat, Yala, Narathiwat, and Pattani. These stations are currently under construction. [Text] [BK111042 Bangkok Domestic Service in Thai 0000 GMT 11 Dec 83]

CSO: 5500/4356

## INTERNATIONAL AFFAIRS

### MAGHREB STAKING ITS FUTURE ON TELECOMMUNICATIONS

Paris TELECOMMUNICATIONS in French N° 49 Oct 83 pp 44-52

[Text] The Maghreb has decided to build its own telecommunications industry, and is well on the way to doing so. Morocco, Algeria, and Tunisia have agreed to pool their efforts for at least the next 10 years. Going for them is their position at a geopolitical nerve-center, a young and highly literate population, much of it with solid professional training, and not just one, but two common languages, plus an already creditable telephone system...not to mention a long tradition of international cooperation.

In Arabic, the expression "al Djazirah al Moghrib" means "the western island." With the Atlantic on its western shores, the Mediterranean on the North, and the Sahara on the south, the Maghreb indeed looks very like an island on the map. Few of the world's regions are so clearly outlined. Then there is its physical homogeneity, which perhaps has more than a little to do with its marked ethnic, religious, and overall cultural unity, but by no means betokens isolation. This particular "island" is also a busy crossroads, where people from the Arab countries, Europe, and Black Africa constantly come and go.

### Three Nations That Stick Together

Pre-Islamic North Africa, whose Berber population has roots that go back to the dawn of history, was once an integral part of the Western Mediterranean community. The imposing ruins at Volubilis, Tipasa, Dougga, or El-Djem bear silent witness to the days when this was one of Rome's most flourishing colonies -- as well as one of its most turbulent ones.

Toward the end of the 7th century, the Arab wave of conquest pushed what was left of the Eastern Empire back to the frontiers of Europe, thereby altering that entire environment at a single stroke and for centuries to come. Carthage was destroyed -- this time for good -- in 698, and that kingdom became the land for whose conversion the Bedouin desert riders set out from Mecca and swept like wind across

treacherous moving sands of Syrtis, turning it into a western outpost of Islam. Thus the Maghreb was founded, like Europe's societies and at about the same time, by invaders from the East. This historical symmetry, however, kept the northern and southern shores of the Mediterranean strangers to each other for more than a millennium. Whereas in Europe the barbarian hordes adopted the Christian faith of their hosts, here the Berber tribes merged with each other to found a muslim society which intimately intermingled religion with every facet of public life. Arabic gained currency gradually throughout the region, although it never did root out the local dialects. Today, the French language is equally widespread.

Despite all these factors working for federation, the Maghreb has known only one brief and far-off interval of unity: in the 12th century (under the Almohade dynasty), and its scission into three distinct territories dates back to antiquity. That division was heightened under Turkish rule, and the French perpetuated it (Morocco and Tunisia were administered by the Foreign Affairs Ministry, while Algeria came under the governance of the Interior Ministry) and, since their independence, the three "brother-countries" have chosen paths which are clearly divergent.

Morocco, whose well-loved symbol is still the indomitable lion, is a monarchy. A sultan, descended from the Prophet and a theoretical vassal of the Ottoman Empire, was de facto absolute ruler there until 1912. The (relatively short-lived) French protectorate undermined his authority without lessening his prestige, and it was quite natural that, when the time came, he should take over leadership of the emancipation movements: in 1956, independence gave him back his throne.

The Moroccan regime today is marked by its respect for tradition, legitimacy rooted in bonds of personal allegiance to King Hassan II, and by a degree of moderation.

Altogether different is the path Algeria has chosen to follow. An ancient conglomeration of independent port cities over which a Turkish Dey was supposed to wield some authority, it was invaded and subsequently governed directly by France from 1830 to 1962. A very large European minority moved into the country: as of 1954 it numbered 984,000 souls. Independence, which came under tragic circumstances, sent most of them back to the ancestral country. The people running Algeria today are veterans of the armed struggle; they favored a revolutionary orientation, which President Chadli Ben Djedid has astutely curbed to the constraints of development. It is the most highly industrialized and the largest of the Maghreb States, but 85 percent of its territory is barren desert.

As for Tunisia, before it became a French protectorate, it too was governed by a representative of the Sublime Porte, a personage known as the Bey. The unconscionable Treaty of Bardo in 1881 stripped

that already powerless monarch of all but honorary token functions, and independence signed the warrant for his departure after a brief "regency" (1954-1957). Since then, the Neodestour (neo-constitutional) Party has governed, under the authority of President Bourguiba, a system combining pragmatic socialism with a gradual liberalization of political life. Tunisia owes its reputation of refinement to the key position it occupies in the area, bringing it into contact with all of the Mediterranean civilizations and cultures. Known to the ancients as "Afric," it has given its name to the continent, where its influence is out of all proportion to its modest size.

And so it is that all three states cultivate their own individuality, but the rivalry among them involves no substantial differences and is not without a kind of solidarity (surely no one has forgotten the unwavering support Morocco and Tunisia lent Algeria in its struggle for independence). A single culture, and a single Islamic philosophy inform their policies. They are called upon, very often together, to cope with similar economic problems. So it is that if there is one single sector in which the Maghreb seems determined to make into one of the driving forces of its development, one in which there can be no shadow of doubt as to the need for unity, that sector is telecommunications.

#### A Counterpart with Clout

In all, there are 700,000 telephone trunk lines and 9,000 Telex terminals to serve a population of more than 48 million people: in the OAU, one in ten and one African telephone in three is in the Maghreb. With almost two lines for every 100 inhabitants, Tunisia can boast of the highest-density system in the Organization. The growth rate of the Maghreb system, which, overall, runs at about 10 percent per year, can stand comparison with those of the nations of Western Europe or Asia (the only ones who have doubled the number of their lines in 10 years, while the world average rate was around 7 percent). For economies in which capital is hard to come by, that is a tremendous achievement.

Growth, however, involves requirements, and the current demand is about equivalent to half the users already served. It takes several months, sometimes several years, to get a telephone installed. Well, by the year 2000, the region's population will have swelled by 10 million people...

Maghreb's threefold membership in the Arab world, in Africa, and in the Western Mediterranean have led it to institute its telecommunications system: it is now a solid network of coaxial cables and herzian links. No fewer than ten submarine cables carry message traffic to and from France (see inset, below). Further, the Maghreb States have no intention of being left out of the grand adventure of space telecommunications. It was in Bizerte, Tunisia,

that the Arab League foreign ministers met 16 years ago to agree on a joint satellite communications organization, known as Arab-sat. Launching of their first earth-stationary satellite aboard the European-built Ariane launcher (with Aerospatiale as prime contractor) is scheduled for the latter half of 1984. This satellite will gradually take over all the long-distance traffic of 20 Arab League countries, and will provide them with two to four color TV channels. The Maghreb's financial contribution to Arab-sat is still modest, compared with those of the wealthy oil states on the Arabian Peninsula, but it has every intention of making its presence felt.

All three States, in fact, play a major role in a number of organizations. Their representatives currently occupy two of the 11 African seats of the board of directors of the International Telecommunications System (UIT), a board whose vice-chairmanship this year is filled by Algeria. We would point out here that the position of UIT's general secretariat was occupied for 12 years by a Tunisian, Mohammed Milli. It was in large part thanks to his tenacity -- and with the support of France -- that the United Nations, of which UIT is a specialized agency, proclaimed 1978-1987 "the Decade of Transport and Communications in Africa." The Maghreb countries are actively participating in sundry regional bodies such as the Arab Telecommunications Union (UAT), the Arab and Mid-East system known as Medarabtel, and the Pan-African Telecommunications Union (UPAT).

#### Priority for the Sector

The establishment of three telecommunications services in the Maghreb closely resembles that of France. They are run by a director or director-general who is part of a Postal and Telecommunications (PTT) Secretariat of State (in Tunisia) or a PTT Minister (in Algeria and Morocco). All three administrations are distinguished by their vigilant protection of the state monopolies and by the tight rein they keep on spending: an annual budget that is absolutely ironclad and limited recourse to international financing have forced all of them to run very tight ships. This has enabled them to implement an intensive policy of replacing and expanding the system. At present, the transition to electronics and adoption of a community-wide industrial development program is opening up far more ambitious prospects for them.

Morocco has put forth a major effort in moving from about 100,000 subscribers to nearly 200,000 (93 percent of them tied into the automatic switching system) today. With a population of 22.3 million, this country has almost a line for every 100 people (not to mention the 4,500 Telex terminals on line).

Right now, saturation in the Moroccan system is a matter for some concern, even so, since more than 100,000 would-be telephone customers are waiting for their phones -- which they will doubtless be getting within 2 years: there is a 5-year plan (1981-1985) that

calls for construction of 120,000 trunk lines and 2,800 Telex terminals (there are 1,000 pending applications for Telex service now). The plan also calls for automation of some 40 towns and cities, extension of the Herzien system to 3,880 kilometers, construction of six maritime radio and one ground radio stations, and, finally, providing service to 76 rural communes currently without service. Mohand Laenser, Morocco's PTT Minister, has set a target for the year 2000 of 1.6 to 2 million trunk lines.

His opposite number in Algeria, Mohamed Cherif, hopes to bring in similar numbers by 1999, and has set a target for the year 2000 of 1.2 to 2 million trunk lines, and has set his sights on 700,000 subscribers by 1985. The Algerian telephone system has made a real "leap forward" from 252,000 trunk lines in 1972 to 360,000 last year, for a population of 20 million. That means that right now Algeria is fast approaching a level of 2 lines per 100 inhabitants. In the capital, telephone density is close to 6 percent. Installation of a fully-automatic system is one of the great ambitions of the Algerian communications people. In its first phase, all 31 "wilayas" (counties) will come on line, and then it will be the turn of the 160 "dairas" (districts), and, finally, that of the 740 communes in the country. Taken together, these expansions will expand the system to four times its present size.

The Tunisians are ahead of the other Maghreb States, not only in their system's density (130,000 trunk lines for 6.7 million inhabitants in 1983), but also in its modernity and its growth rate, which topped 13 percent in each of the past 6 years). Their next targets call for 450,000 trunk lines in 1986 and 750,000 by 1991. Tunisia is sparing no expense on updating its telecommunications: the 1981-1986 development plan calls for threefold expansion of investments in the sector. It is the first country in the Maghreb to talk seriously of an "all-electronic" system, but the other two seem to be following its lead.

### The Electronic Option

Why this particular choice? In telecommunications, it is the most advanced equipment that best meets the needs of development. It is more reliable, closer to the state of the art, easier to maintain and, above all, it can cope with the future: first, because you can set up an electronic system in modules, which is far harder to do with a conventional system, and also because practically all exchanges coming on the market in the next few years will be electronic. Furthermore, the digital technique will open the way to automatic data transfer which is also bound to be a major factor in economic and cultural development. The Institute for study and research in the teaching of Arabic (IERA) in Rabat is already working on an initial data bank containing all current Arabic terminologies; by the end of next year, it will have built up a thesaurus of 5,000 such words.

Morocco is also the first of the Maghreb countries to acquire an electronic switching central (an 11,000-line E 10-A, installed in Fez in 1972). These days, it is working with two companies on updating its system: Sweden's LM Ericsson and France's CIT-Alcatel. The latter supplied the Fez system and has just got the contract for four operations (Fez-extension, Tangier, Oujda, and Meknes), representing a total of 46,000 new lines. Two Metaconta units have also been installed, one at Rabat and the other at Casablanca. Altogether, the Moroccan system contains several thousand kilometers of coaxial cables and Hertz bands, mainly bought from French companies.

For Tunisian telecommunications, the future is now: the electronic automatic switching equipment they are bringing on line now is in the process of tying in 120,000 new subscribers. As in Morocco, LM Ericsson and CIT-Alcatel are sharing the job. The Swedes are handling northern Tunisia and the French the south. The agenda is heavy: 60 percent of the 450,000 trunk lines called for in 1986 must be hooked into the new switching stations. In order to meet demand more efficiently, a French consortium consisting of Câbles de Lyon, SAT, and TRT has engaged CIT-Alcatel to coordinate the whole job.

It is worth noting that all the transmission links installed under these contracts use mainly French technology. SAT will lay the two 140-Mbit/sec. coaxial main lines to extend the Tunis-Gabès lines to the Algerian and Libyan borders: one can already descry in this a first step on the Maghrebian scale to which all three States attach very special importance: the Casablanca-Tripoli coaxial cable link along the coast.

The Algerian PTT people have also opted for the electronic road. They have released a call for bids on 160,000 real-time lines, and picked CIT-Alcatel to build two E 10-B stations, each with 100,000 lines, at Chlef and Chettia (near the El-Asnam site).

### Building Together

Clearly, the Maghreb is not lacking in ambition, aware of the fact that its development depends heavily on a modern telecommunications system. However, the installation of such a system is not innocent of peril for its independence; manufacturing equipment relying on advanced technologies calls for an industrial climate and an investment capacity that is, for the time being, far beyond its reach. This means that Morocco, Algeria, and Tunisia will have to move toward massive acquisitions, or cooperate (among themselves and with the supplier countries). Until now, urgent need has on occasion forced Maghrebian governments to opt for the first solution. But even as they did so, they have always considered it a stopgap, and have no intention of giving up on "endogenous" modernization. As a Maghrebian sociologist, Habib Ishow, puts it: "Our nationals must be brought into all levels of design and production if development is really to get off the ground."

Accordingly, factories have sprouted in all three countries, a bit diverse in order. The main thing is to coordinate their output so as to make them complementary at the regional level: a 10-year development plan is now in the negotiating stage among the three governments, whose spokesmen meet every month to put new touches on their "industrial task distribution" design. The same applies to import contracts including technology transfers. The aim: to build a complete production line (stations, lines, and terminals) to be run by existing local industry.

Morocco has set up a company that is wholly government-controlled, known as the National Telecommunications Company (SNT). In 1980, this firm joined with France's Thomson-CSF to found a Moroccan telephone company (Somartel), in which SNT holds a majority interest. This plant currently assembles CP-400 switching stations. The Moroccan Cable Telecommunications Company (Martecia), in which the state also holds a majority interest, enabled Morocco to get a toe in the door of a complementary sector. A number of mixed companies (using French and Moroccan capital) are offering sundry equipment: one such is CGCT-Maroc, which produces Pentaconta and Metaconta equipment, CGE, which operates a cable-spinning plant in Morocco, and the Tecmatel (SAGEM subsidiary) company and SFRM (owned by Thomson-CSF).

As for Algeria, it has started a truly national telecommunications industry, currently represented by two state-owned companies: the National Telecommunications Infrastructure Company (Sonatite), specializing in lines, which operates a cable-spinning plant at Oued Sma, and the National Electrical and Electronic Equipment Manufacturing and Installation Company (Sonelec), which has built a factory to manufacture Pentaconta crossbar equipment at Tlemcen. The plant was designed and built with help from the SESA company, a Spanish subsidiary of the American ITT company, which now employs 1,600 people. The government's recent decision to go to real-time switching will probably mean some changes in the plant's production planning.

The Chakira plant on the outskirts of Tunis spins cables for the Tunisian system.

If all these undertakings in Algeria, in Tunisia, and in Morocco, are together to blaze the trail toward an industrial telecommunications complex, simply coordinating them is not enough; there must also be contracts at the regional level for technology transfers signed with the builder countries. Algerians, Moroccans, and Tunisians alike all devote very special attention to vocational and professional training; in their view this must aim from now on at acquiring a particular kind of technology, rather than, as is still frequently the case, at a particular kind of equipment.

France, by reason of its close ties with North Africa and because its own telecommunications have become one of its most advanced sectors, has a role to play. Cooperating with the Maghreb

countries in completing a community-wide industrial program would, as Louis Mexandeau, minister delegate for PTT to the Ministry of Industry and Research, put it, "open the way to an enhancement of France's contribution in this region."

#### New Kind of Cooperation Between France and the Maghreb

The cooperation between France and the Maghreb countries in the telecommunications sector did not really take off until the Seventies, but right now it is going through a particularly felicitous phase. Even during the spells of "snappishness," it had never completely halted, especially in cadre training (close to 80 engineers and administrators were trained in the French PTT's advanced schools by 1970, and more than 150 more since 1970). These last few years have seen a thaw in relations between governments, bringing a warmer and more official climate marked by several bilateral meetings: Minister Delegate Louis Mexandeau, for instance, paid a visit to Algeria in October 1981, another to Morocco in September 1982, and one to Tunisia in May 1983. These contacts made it possible to ease relations beyond mere sales and information, into a policy of confident cooperation.

Morocco was the first of the three partners to order conventional and, later, electronic equipment, and to call on French companies for help in establishing plants to manufacture or assemble equipment, and relations with the kingdom have remained close. They were first formalized on 25 March 1976 in a protocol of agreement centering on training personnel which called, among other things, for establishment of a joint Franco-Moroccan committee. At the committee's second session, the two PTT ministers, on 6 September 1982, signed a new protocol remarkable for its global approach. The main points in the agreement have to do with streamlining administrative structures, training upper-level cadres, developing and modernizing services, encouraging adoption of new products, and expanding research. Yearly cooperation programs provide for scholarship grants and short-term missions. During the 1982-1983 scholastic year, some 30 Moroccan students were able to get high-level training at the Directorate for Higher Technical Education. That is a sizable contingent by comparison with the number of trainees from other countries.

After being Algeria's first suppliers during the first years of its independence, French industry confined its efforts in that direction to small-scale and one-shot contracts. Naturally, those contracts would be fairly skimpy in the area of training, but this country's relations with France were for a lengthy spell far short of their possibilities.

Things have changed, though, in the past 2 years, and the French President's visit to Algiers in November 1981 opened the way to a resumption of cooperation. In the PTT area, Louis Mexandreau's presence at the inauguration of the "Algiers-Marseille III" cable

became operative with the signing of an economic cooperation protocol on 12 June 1982. That led to the creation of a Franco-Algerian working group that meets regularly, sometimes in Algeria, sometimes in France, to work over the details of cooperation projects (resource planning, operation and maintenance, research ...). While this was going on, trade underwent a new and remarkable spurt in growth. In the data transmission area, SAT, which in 1979 successfully brought in the first digital equipment (there was a commitment to pay for and remove the equipment at French expense if it failed to give complete satisfaction), gradually built up a market for a hertz line for the Oran region, as well as for an air traffic control center at the National Sea and Airport Enterprise (ENEMA). For its part, the Thomson -CSF Company set up the hertz link between Oran and Béchar. As for message traffic handling, CIT-Alcatel, as noted, won the contract for installing the two E-10-B stations. Other, smaller, French contractors signed some sizable contracts. And finally, the training programs involved, as they had for Morocco, scholarships, as well as training or recycling programs and assignment of experts.

Algeria faces the same structural problems as its neighbors, but here they are more urgent: its population is either too scattered or too concentrated over an immense territory where communications are difficult. Conditions like this make a telephone system all the more vitally needed.-- and at the same time more costly. The Algerians are therefore understandably more keenly interested in the new long-distance technologies for telecommunications and are eager to open their own research center. Studies conducted in concert with the Algerian government and experts from France's National Center for Telecommunications Studies (CNET) should be reaching the project stage very shortly. Along the same lines, in November 1982 Algiers was host to an UPAT seminar devoted to the "promotion and development of scientific research and of telecommunications industries in Africa." France made a major contribution to the discussions there with papers on modern training techniques.

At about the same time, the laying of a third underseas cable between Tunisia and France gave rise to two more agreements: a supply contract between Tunisia's TUNITEL company and France's SUB-MARCOM, and an agreement covering construction, operation, and maintenance signed by both governments. The first tangible fruit of these contracts was the joint inauguration, by Louis Mexandeau and his Tunisian opposite number, Brahim Khouadja, of the first two E 10-B stations to come on line in the districts of Sfax and Sousse. With his emphasis in his remarks on that occasion on the absolute necessity for training operations, which, in his view, must accompany any such material advances, the French minister underscored the duties incumbent on France as a result of Tunisia's choice of a wholly electronic telecommunications system.

This spirit of Franco-Tunisian cooperation was translated in 1982 into 54 months of training courses in France for Tunisian technicians and into numerous missions to Tunisia by French experts.

For their part, both CIT-Alcatel and SAT are mounting intensive training centers in-country. Meanwhile, Tunisia, like Algeria and Morocco, is training maintenance technicians (providing the instructors and financing the courses), and Cit-Alcatel, in the fall of 1981, opened a center to train workers in real-time techniques at the Tunis Telecommunications Institute. Two classes trained in maintenance technology for the new switching stations have already been graduated.

The flawless conditions under which French industry has managed to introduce digital transmission and switching techniques here have won the highest admiration in all three countries. Furthermore, France has faith in the viability of the Maghreb's industrial plan. It can offer the planners helpful, no-strings support: in the view of the French government, insuring good communications with its North African partners is more than sound business practice. It is a symbol.

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## Ten Submarine Cables Link the Maghreb with France

There are ten submarine cables that tie France to the Maghreb today. Their combined capacity is close to 10,000 channels, distributed just about evenly among the three Maghreb countries (Morocco has 3,316, Algeria has 3,220, and Tunisia 3,348). Of this capacity, 2,252 circuits handle the total burden of communications with France: 731 are assigned to traffic with Morocco and 1,103 to traffic with Algeria, while 418 are set aside for traffic with Tunisia (the balance is shifted to other international traffic). They account for 61 percent of our international cable traffic and for 34 percent of all our international cable circuits. The traffic is very heavy: in traffic from France to the Maghreb, we have hit 175 million paid minutes in 1981 (France-Morocco: 56 million; France-Algeria: 78 million; France-Tunisia: 41 million). Calls in the opposite direction are not counted, under the provisions of an agreement that assumes they will offset one another, but calls from the Maghreb to France are probably fewer in number. The dimensions of the telephone traffic run parallel to the migratory flow of population (there are now more than 1,500,000 Algerians, Moroccans, and Tunisians in France and 120,000 French nationals in the Maghreb), and both expatriate populations are currently tending toward stabilization.

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CABLES	TOTAL CAPACITIES
<hr/>	
Morocco-France	
Casablanca-Penmarc'h .....	640 channels
Tétouan-Canet-Plage.. ..	96 channels
Tétouan-Martigues .....	2,580 channels
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Algeria-France	
Oran-Carnet-Plage.....	80 channels
Alger I-Marseille.....	80 channels
Alger II-Marseille.....	480 channels
Alger-Martigues.....	2,580 channels
<hr/>	
Tunisia-France	
Bizerte I-Marseille.....	128 channels
Bizerte II-Carnet-Plage.....	640 channels
Bizerte-III-Martigues.....	2,580 channels
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TOTAL.....	9,884 channels
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## Morocco

Looking out upon the Atlantic (from 1,000 kilometers of coastline) and upon the Mediterranean (from about 500 kilometers of coastline), Morocco covers an area of 710,000 square kilometers.

Four great mountain ranges -- the Rif, the Middle Atlas, the High Atlas, and the Atlas foothills -- cut across the country. The Rif runs along almost the entire Atlantic coast from the Straits of Gibraltar. The Middle Atlas, a vast virgule slashing from northwest to southeast, links the Rif, from which it is separated by the Taza corridor, with the High Atlas; it is Morocco's "water-tower," and some of its peaks tower to heights of 3,000 meters.

The High Atlas is the tallest (Mt Toubkai rises to 4,165 meters): it reaches all the way to the coast in the Agadir region. The southernmost Atlas foothills are actually the upthrust rim of the Saharan Shelf.

Aside from these ranges, a string of plateaux steps down toward the plains along the Atlantic Coast.

There are numerous streams and rivers, but their flows are highly seasonal, with crests in winter and low or zero flows in summer.

Morocco's climate, temperate in the Mediterranean and Atlantic coastal zones, becomes more rigorous toward the interior of the country. Precipitation is heaviest in the Middle Atlas, which holds magnificent stands of cedar. The plateaux are semi-arid steppes, while the land to the south of the Atlas foothills is desert.

A young, rural, and fast-growing population (22,300,000 in 1982) is a guarantee of the country's continuing vitality.

Most of Morocco's revenue is derived from its phosphate resources (it leads the world in phosphate exports), with the balance coming from the tourist trade and from agriculture.

The Seventies were a decade of sustained growth for Morocco (on the order of 3 percent per year), during which it launched a major development program. Avoiding grandiose and costly projects of dubious value, it neglected neither its agricultural sector nor the steady buildup of a small industrial base tailored to the country's capacities.

With its 1981-1985 plan, Morocco is now entering upon a more difficult period. It began here, as it did in many Mediterranean countries, with 2 years of drought that adversely affected farm production, while a decline in worldwide demand depressed its phosphate exports, which for some time had offset its oil bills.

France is Morocco's major trading partner. In 1981, trade with France accounted for 25 percent of its imports and 22 percent of its export sales.

### Political System

The head of state is King Hassan II. He is the chief executive. Legislative power is vested in the Parliament, made up of the Chamber of Representatives and the Chamber of Counsellors.

### MOROCCO'S SOCIO-ECONOMIC INDICATORS (1980)

INDICATORS	MOROCCO
Area (in sq. km.)	710.000
Population (1982)	
Population (1982)	23,300,000
Population density (per sq.km., 1982)	31
Average annual population growth (1970-1979)	2.9%
Percent of population under 15 years of age	46%
Rural population (% of total)	60%
Urban population (annual growth rate)	4.5%
Infant mortality (per 1,000 births prior to 1 year)	120
Life expectancy at birth	56 years
GNP (in millions of 1980 dollars)	17,300
GNP per capita (in 1980 dollars)	875
Average annual GNP growth per capita	
1960-1969	2.6%
1970-1979	3.5%
Inflation rate (1980 as compared with 1979)	9.5%
Self-sufficiency in food (1980 estimates)	75%
Agriculture's share of GNP (%)	20%
Industry's share of GNP	32%
Service sector's share of GNP	48%
Number of people per physician (1977)	10,000

(ECONOMIC INDICATORS, cont'd.)

Population with access to potable water	55%
Illiteracy rate	65%
Share of trade with industrialized countries	84%
Share of intra-Maghreb trade in total foreign trade	1%

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Trade with France in 1982 in millions of French francs  
(Source: CFCE)

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Principal French Imports

Fruits and vegetables	750
Sundry minerals	710
Clothing	566
Cereal-based products	476
Shoes	211
Knitwear	207

Principal French Exports

Machinery, industrial equipment	961
Automobiles, transport	754
Electrical equipment	656
Aircraft	648
Organic chemicals	422

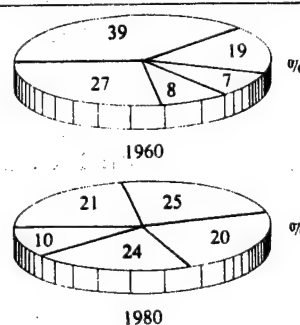
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In 1982, the deficit in Morocco's balance of trade came to \$2.2 billion. (Source: Expansion)

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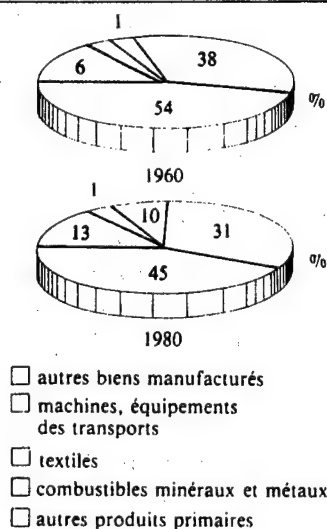
- \* Machinery, transport equipment
- \* Other primary products
- \* Fuels
- \* Other manufactured goods
- \* Food products

STRUCTURE OF IMPORTS OF  
GOODS (Source: IBRD)



- \* Other manufactured goods
- \* Machinery, transport equipment
- \* Textiles
- \* Mineral fuels and metals
- \* Other primary products

#### STRUCTURE OF IMPORTS OF GOODS (Source: IBRD)



### ALGERIA

To the north, 1,000 kilometers of Mediterranean coastline, practically a straight line; to the south, the vast expanse of the Sahara. Algeria is a very large country, covering 2,381,743 square kilometers.

#### The Northern Region

The Mediterranean Atlas range runs parallel with the coastal plain; its elevation gradually rises from west to east, until it reaches and tops 2,000 meters in the Grand Kabylia; to the south, vast plateaux extend as far as the Saharian Atlas.

Most of the watercourses are "oueds" and, after a midwinter crest stage, they gradually dwindle and leave dry beds for several months. The streams from the high plateaux empty into closed lakes known as "chotts." Some rivers (the Chéiff and the Mitidja) never run dry.

The coastal plain is fertile, partially covered with Mediterranean maquis (chaparral) and orange and olive groves. The plateau and the flanks of the Saharian Atlas are steppes.

#### The Sahara

The Algerian Sahara (1,996,000 sq.km. or so in extent) is a vast platform, below which lie rocky barriers and volcanic mountain ranges like the Hoggar. The air is extremely dry: years may pass without a single drop of rain. Some widely-scattered oases are extremely fertile and intensively cultivated for a variety of crops, and some are still peopled by aboriginal micro-societies (Mozabites and others...).

Algeria's population (20,100,000 in 1982) is heavily concentrated along the coastal plain, mainly in the towns and cities. It is growing fairly fast at 3.3 percent per year.

The country's principal resource is hydrocarbon fuels.

With reserves estimated as abundant for another 25 years, Algeria in 1981 exported 800,000 barrels of oil per day, which brought in revenues exceeding \$10 billion for the year. That rate of production has been cut back from 1980 (which hit more than a million barrels per day) to conserve remaining resources. Oil revenues will undoubtedly stabilize over the next few years.

In 1981, transfers of funds from Algerian workers in France were running at around \$400 million. Directly hit by the recession in the industrial countries, these revenues are doomed to decline.

Algeria's agriculture accounts for 8 percent of GNP, and satisfies 50 percent of the country's food requirements.

As for industry, it has been growing and flourishing, thanks to its priority among government investments. The huge Skikhda project, latest of Algeria's achievements, in 1981 tripled Algeria's oil refining capacity. Since President Chadli Ben Djedid was elected in 1978, the development philosophy seems to redirect the nation's efforts toward housing, transport, and basic consumer products.

France is Algeria's leading supplier, followed by Germany and Italy. Franco-Algerian trade increased sharply in 1982, but the balance of trade shows a French deficit of 11.9 billion francs.

The 1963 constitution proclaimed Algeria as a "Democratic People's Republic," and asserted the leadership role of the National Liberation Front (FLN).

The legislative power is vested in the elected National Assembly (all candidates are FLN members) for 5 years. Executive power is vested in the President of the Republic, who is elected for a 5-year term by the National Assembly.

In 1982, Algeria's trade balance was in the black with a surplus of \$2.395 billion (source: Expansion).

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Trade with France, 1st-half 1981, in millions of French France (CFCE)

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* French Exports	
Industrial machinery	3,747.5
Chemicals	876.5
Steel, metallurgical products	771.2
Electrical industrial products	532
Farm products	482
Textiles	75
Miscellaneous	137

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\* French Imports

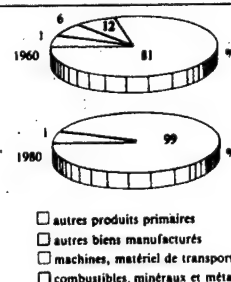
Crude oil	2,964.6
Natural gas	1,257
Agricultural products	20.8

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STRUCTURE OF EXPORTS OF  
GOODS (source: IBRD)

- \* Other primary products
- \* Other manufactured goods
- \* Machinery, transport equipment
- \* Fuels, minerals, metals

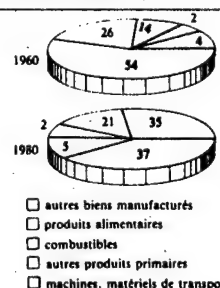
Structure des exportations  
de marchandises (source BIRD)



STRUCTURE OF IMPORTS  
OF GOODS (source: IBRD)

- \* Other manufactured goods
- \* Food products
- \* Fuels
- \* Other primary products
- \* Machinery, transport equipment

Structure des importations  
de marchandises (source BIRD)




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TUNISIA

Bounded on the north and on the east by the Mediterranean, Tunisia, with its 165,000 square kilometers of territory, is the smallest of the three Maghreb countries.

To the north, the mountain ranges stretching to the northeast are traversed by fertile valleys. To the east, the mountains taper down to a plain along the Mediterranean shore, and to the south they end in a zone of salt lakes (chotts) and depressions.

The rivers in the north flow year-round, while those in the south are typical oueds. The climate becomes drier as one heads south, and the vegetation gradually shifts from Mediterranean chaparral to steppe, only to vanish altogether in the Saharan regions.

In 1982, Tunisia's population was 6,700,000, and growing fast.

Tunisia's wealth comes from its phosphates, for which it ranks fifth among the world's producers, and from its youthful oil operations which have given it production of 100,000 barrels per day ever since 1979, and which accounted for more than half its 1980 exports.

During the Seventies, Tunisia underwent a very strong growth phase (on the order of 7.5 percent per year) by implementing a policy of balanced development. Exploitation of natural resources (oil and phosphates) and of the tourist trade was accompanied by expansion in the agricultural sector and a spectacular takeoff in sub-contracting (machinery, textiles, etc.) by deliberately playing the international distribution of labor card. By way of windfall, it also benefited by the shift of certain financial activities owing to the war in Lebanon.

The decline in the international economic picture, for a country whose revenues are extremely sensitive to the health of the world's economy, brought a slowdown of activity in 1982.

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Trade with France in 1981 (in millions of French francs). (Source: CFCE)

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Principal French Imports

* Mineral oils and fuels	824
* Clothing and textiles	388
* Fertilizers	185
* Fruits and citrus products	158

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Principal French Exports

* Machine tools	850
* Vehicles	650
* Cast iron, iron, and steel	405
* Electric machinery	401
* Cereal grains	319

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TUNISIA'S SOCIO-ECONOMIC INDICATORS, 1980

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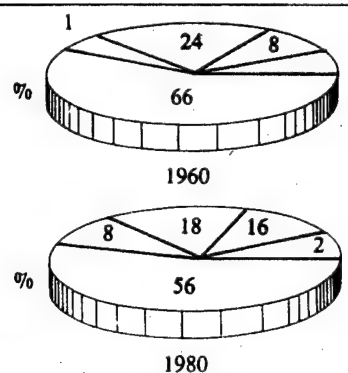
INDICATORS	TUNISIA
Total land-mass (km <sup>2</sup> )	165,000
Population 1982)	6,700,000
Population density (per km <sup>2</sup> )	40
Mean annual population growth (1970-1979)	2.1%
Percent of population under age 15	42 %
Rural population (as % of total population)	50 %
Urban population (annual growth rate)	4 %

## ECONOMIC INDICATORS, TUNISIA (cont'd.)

Infant mortality per thousand prior to first birthday	80
Life expectancy at birth	58 years
GNP (in millions of 1980 dollars)	8.5
GNP per capita (1980 dollars)	1,300
Average annual growth in per-capita GNP	
1960-1969	4.8%
1970-1979	7.5%
Inflation rate (1980 as against 1979)	10%
Self-sufficiency in food (1980 estimates)	55%
Agriculture's share of GNP	16%
Industry's share of GNP	36%
Service sector share in GNP	48%
Number of people per physician(1977)	4,500
Population having access to drinking water	77%
Illiteracy rate	40%
Proportion of trade with industrialized countries	85%
Intra-Maghreb trade share of total foreign trade	2%

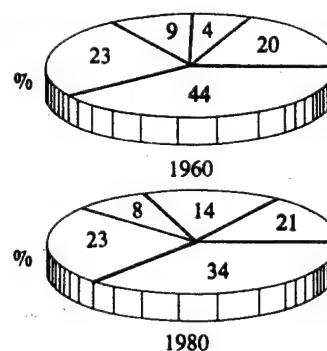
### STRUCTURE OF EXPORTS OF GOODS

- \* Machinery, transport equipment
- \* Other manufactured goods
- \* Textiles
- \* Other primary products
- \* Fuels, minerals and metals



### STRUCTURE OF IMPORTS OF GOODS

- \* Food products
- \* Fuels
- \* Other primary products
- \* Machinery, transport equipment
- \* Other manufactured products
- \* Other manufactured goods



6182

CS0: 5500/4600

## BRIEFS

TELEPHONE SYSTEM ORDER TO FINNISH FIRM--All indications are that Egypt is going to order a telephone system worth 150 million Finnish marks from Finland's Telenokia. During the negotiations underway in Cairo concerning development cooperation between Finland and Egypt, it was agreed that a telephone system for two Egyptian cities would be included in the cooperation agreement for the following 5-year period. Among other things, the telephone system will include digital telephone exchanges, cables, and telephone exchange buildings. This will be the first delivery of a complete telephone system to another country. The actual negotiations on the agreement will begin in January. The value of all development cooperation between Finland and Egypt in 1984 will total nearly 70 million marks. [Text] [Helsinki HUFVUDSTADSBLADET in Swedish 30 Nov 83 p 14] 11798

CSO: 5500/2584

INDIA

UN DELEGATE SPEAKS ON INFORMATION 'IMBALANCE'

New Delhi PATRIOT in English 29 Oct 83 p 3

[Text] United Nations, Oct 28 (PTI)--India yesterday drew attention to the 'real danger' of existing imbalances in the information and communications field being accentuated unless the developing countries were assisted in overcoming their technical, financial and other difficulties.

Indian delegate Najma Heptullah, told the special political committee that the developing countries would not be expected to accept that their concerns and cultures be transmitted to foreign audiences through the distortions of alien perception.

With the current development in communication technology especially in the area of computers and satellites which were high-technology intensive, there was a real danger that the existing imbalances might be accentuated.

The debate in the committee on information questions underlined the effects of the monopoly and global news gathering on the developing countries and the need for a new international information order.

Soviet representative Vladimir Kazakov, made his country's support to any initiatives to stimulate states to right the imbalance in information. The present system of information exchange monopolised by just a few eastern-based corporations ran counter to the best interests of most member states. [as published]

In her speech, Dr (Mrs) Heptullah spoke of the impact of the non-aligned news pool and said the pool was bound to bring down barriers of ignorance which existed among these countries not only about each other's problems and pitfalls, but also about their post-independence achievements in social development, science and technology and technical cooperation.

While welcoming the efforts of the UN department of public information to strengthen its cooperation with the pool, she said there was further scope for broadening his cooperation. [as published]

Dr Heptullah also stressed the need to develop a world-wide communication network composed of many different systems, characterisation of each society, in which the most advanced technologies would be flexibly geared to the needs of all human communities.

CSO: 5500/7032

## ALL-INDIA RADIO UPGRADES BORDER AREA TRANSMITTERS

New Delhi PATRIOT in English 2 Nov 83 p 5

[Text] Transmitters in 12 out of the border areas are being upgraded to overcome identified night-time interference, particularly from across the borders, reports UNI.

These include two each in the West and the North and seven in the North-Eastern area. In some of these, steps have already been taken for the upgradation, while in others the stations are already radiating at high levels of up to 50 kw medium-wave to 300 kw medium-wave.

The stations in the West are in Gujarat (Rajkot) and Rajasthan (Jodhpur), while the stations in the North are at Punjab (Jalandhar) and one in Jammu and Kashmir (Srinagar).

The North-Eastern stations are Uttar Pradesh (Lucknow) Bihar (Patna), Assam (Gauhati) and (Dibrugarh), Meghalaya (Shillong), West Bengal (Siliguri), Arunachal Pradesh (Itanagar--a new station) and Sikkim (Gangtok).

It is also proposed to cover the western parts of Barmer and Jaisalmer in the next Plan.

Furthermore, it is also proposed to up-grade the existing two units of 250 kw short-wave transmitters and install two transmitters of 500 kw short-wave at Bangalore during the current five-year Plan for external services.

Meanwhile, Information and Broadcasting Ministry sources told UNI that All India Radio's transmissions are also received by people across the borders.

The medium-wave transmissions from Rajkot and Jodhpur are received throughout Pakistan during the night. Srinagar covers during the night west Punjab and Multan in Pakistan. The transmission at Gorakhpur and Lucknow covers Nepal and those at Gauhati and Agartala cover Dhaka and parts of Bangladesh. The medium wave transmitter of 1,000 kw at Calcutta covers Tibet, Burma and Bangladesh.

CSO: 5500/7035

## EFFORTS TO UTILIZE INSAT-1B DESCRIBED

Calcutta THE STATESMAN in English 2 Nov 83 p 9

[Text] New Delhi, Nov 1--The Posts and Telegraphs Department of the Communications Ministry has already "accessed" all the 30 earth stations including the two for the Oil and Natural Gas Commission with the "INSAT 1-B," according to Mr M.L. Rawal, Deputy Director General (Satellites) reports UNI.

Circuits loading is going apace with satisfactory results. More circuits are being added to the work linking the metropolitan cities, State capitals and important towns. This, according to Mr Rawal, will lend flexibility in terms of increased circuits between any two earth stations on the one hand and reliability to trunk route by providing an alternative media to microwave and icoaxial systems.

The INSAT 1-B being capital intensive with limited life, efforts are consequently being intensified to achieve optimum utilization. The P and T has therefore provided transportable terminals which can establish--quick communication with areas hit by floods, cyclones, typhoons or heavy rains which disrupt the telecommunications system.

The national Thermal Power Corporation and the National Hydel Power Corporation are understood to be examining separate plans for using satellite communication for connection their main power stations. The satellite communication can help monitor power generation and ensure rational distribution through the national grid.

The National Physical Laboratory is understood to be giving serious thought to dissemination of time and frequency signals for the entire country via satellite.

Some banks and such other organizations having branches all over the country are considering proposals for making use of the satellite communications system.

It is learnt that some newspapers are also contemplating the use of satellite to facilitate simultaneous printing of their editions from different places.

According to Mr Rawal, the P and T has provided "uplinking" facilities also for the television programmes on both the channels in the satellite. These, it is said, could facilitate telecast of educational, entertainment and health programmes to every nook and corner of the country.

CSO: 5500/7034

## STEP FORWARD TAKEN WITH OPTICAL FIBER DEVELOPMENT

Bombay THE TIMES OF INDIA in English 7 Nov 83 p 5

[Text]

BOMBAY, November 6 (PTI).

**I**N this International Communication Year, India has taken a giant leap forward in communication technology with the indigenous development of a 500-metre optical fibre.

Through this optical fibre, which is essentially a pipe with the thickness of a hair, it is possible to convey 10,000 times the number of speech signals that a conventional microwave system can carry. "The chance of interference, which is one of the main drawbacks of our present communication network, will also be reduced", says Dr. B. V. Rao of the Indian Institute of Technology (IIT) here, who has developed this highly sophisticated communication conveyor.

## WIDELY USED

He told PTI that the optical fibre also promised to be less costly, at least on a per channel basis.

Moreover, the fibre attenuates the signal to a lesser extent than a typical microwave system. "The loss of a speech signal as it propagates through a fibre is only 0.2 DB per km., which is about 0.2 per cent per metre", said Dr. Rao.

This is in wide use in countries like Japan, the United States, West Germany and France. Apparently India is the first developing country to give shape to the optical fibre indigenously. Already, an imported optical fibre network is in experimental use in Pune and it has been reported that the Maharashtra government has plans to introduce it between Bombay and New Bombay, a distance of about 60 kms.

The only drawback of the optical fibre system at present is that it can work only with digital switching systems, like electronic exchanges. Until these conditions are met, its use in this country will be delayed.

Besides communication this system finds application in bio-medical fields. For instance, it is used to view the inaccessible human organs like the parts of the stomach.

The optical fibre is also used for navigatory purposes and in acoustic sensors mainly to trace submarines.

Dr. Rao said the fibre, which consists generally of a boro-silicate core with a phospho-silicate cladding, was developed using a special furnace called graphite resistance furnace.

The preform or the material used for making optical fibre, consisting of the silica core and cladding, is introduced into the furnace at a controlled rate and heated to 2200 degrees Centigrade. The heating is done in an argon environment in order to prevent the oxidation. "For this the argon gas is pumped into the furnace using a special sub-system", he said.

The fibre is drawn at the other end of the furnace into a spooling mechanism.

Dr. Rao said that the project for developing optical fibre indigenously began two years ago with an aid of Rs. 9.75 lakhs from the electronics commission.

He said he had identified immediate research areas in the field of fibre optics. "For instance, the graphite furnace which we use was imported. So indigenous design of this furnace and other related sub-systems should receive the immediate attention of scientists", he said.

CSO: 5500/7036

## MILITARY COMMUNICATION EQUIPMENT TO BE MADE IN INDIA

Calcutta THE STATESMAN in English 25 Nov 83 p 7

[Text] HYDERABAD, Nov. 24--The Hindustan Aeronautics Limited, Hyderabad, will shortly take up production of communication equipment for the Indian Army and Navy, and develop electronic equipment using advanced technology for the Air Force, reports PTI.

The factory, set up in 1965 to produce avionics for MIG aircraft, is now designing several avionics equipment and three types of ground air traffic control radars.

The first indigenously-developed high-power air route surveillance radar, with a range of 200 nautical miles to give complete coverage to air routes in the country, will be installed in a year's time at the Air Force academy, Dundigal.

The HAL has manufactured a new general of precision approach radars which guides the pilot in landing the aircraft in bad weather conditions. The other one is the aircraft surveillance radar.

Besides, the factory has designed 10 avionics equipment along with six supporting ones successfully, comparable in cost and technical expertise to those manufactured anywhere in the world.

Avionics deal mainly with environment-specific equipment vital for air defence. It accounts for almost 40% of the total cost of a modern aircraft.

The sophisticated equipment can withstand temperature shocks and function at temperatures of +55° Celsius to -55° Celsius and also at varying heights.

The first-ever avionics equipment in the country--the identification of friend from foe communication set--was fabricated here way back in 1968.

Choosing the path of "innovating on our own", the HAL, over the years has emerged as an aerospace giant of Asia with 12 operating divisions spread in various parts of the country. It employs more than 40,000 people and has an annual turnover of more than Rs 275 crores.

Another significant contribution of the HAL is its highly advanced high-frequency single-side band air-to-ground communication set made recently, which is used for inter-continental communications. It was highly advanced 400-W power output, with a 100-HZ channel spacing incorporating the latest technology.

CSO: 5500/7048

## BRIEFS

NORTHEAST TELECOM NEEDS--GAUHATI, Nov. 22--For the past four years the need for a reliable telecommunication network in the North-Eastern region has been felt especially because of the law and order situation in the region and the Centre's emphasis of economic growth in backward and "neglected" areas. The recent conference of Congress (I) leaders at Gauhati and the consequent influx of VIPs, including the Prime Minister, also underlined the need for instant links with New Delhi and other centres of importance. Gauhati and Silchar were linked recently with the Calcutta SFT system and thereby, with 56 major centres in India. A proposal to install a SFT control station at Gauhati, if implemented will help link north-eastern towns with Calcutta, Hyderabad, Madras and Bombay. It is the policy of the department to extend more services to the rural areas. The indirect benefit can be appreciated in emergencies like natural disasters and epidemics and in a law and order situation. [Text] [Calcutta THE STATESMAN in English 23 Nov 83 p 14]

MELTRON TRANSCEIVER MANUFACTURE--BOMBAY, November 22--The Maharashtra Electronics Corporation Limited (MELTRON), a state government undertaking, has for the first time in the country introduced very high frequency (VHF) transceivers with a five-tone selective calling facility. The VHF communication equipment has provision for general calling, group calling, emergency calling and automatic acknowledgement tone. The communication system would be useful in hospitals, forest departments, fire brigade, police, defence, airports and electricity boards. The corporation has already procured orders worth Rs. 1 crore for the communication system, according to a press release. The first system is being commissioned at Jalgaon for the irrigation department of the government of Maharashtra. Meltron has commissioned its radio communication project at Nagpur which has begun commercial production of VHF transreceivers, portable walkie-talkie in low band, high band and multichannel radio link equipment. The factory has been built with the technical collaboration of Brown Boveri and Company, Switzerland. [Text] [Bombay THE TIMES OF INDIA in English 24 Nov 83 p 19]

CSO: 5500/7047

## DIGITAL BROADCAST EXPERIMENTS OFFER PROTECTION FROM JAMMING, DISTORTION

Moscow TASS in English 1220 GMT 29 Nov 83

[TASS item: "Digital Radio Broadcasting Experiment"]

[Text] Moscow, 29 Nov (TASS)--Experimental broadcasts, based on the use of a digital code, have been held successfully in the Soviet Union for the first time. They demonstrated the advantages of the new broadcasting technique over the conventional one, Vladimir Simakov, an official of the Ministry of the Means of Communication Industry of the USSR, said in a TASS interview. The results of the tests give ground to hope that this method will become in the future a basis for mass high-quality broadcasting in the ultra-short wave range.

The essence of the new method consists in the conversion of acoustic waves into a row of figures which are transmitted as pulses of one frequency. Such a signal, picked by a receiver, is automatically decoded and amplified and then goes to an acoustic system for sound reproduction.

Among the advantages of digital radio broadcasting, demonstrated during experimental broadcasts, is that it offers effective protection against jamming and distortion, Vladimir Simakov said.

The use of a digital code helps markedly improve the quality of reproduction of radio programmes. The theoretical principles underlying digital broadcasting will help attain in the homes a quality of sound similar to that in studios. The new receivers decoding digital pulses will be much smaller than conventional models.

Digital broadcasting will also help solve the problem of "crowded conditions" in the air, Vladimir Simakov said. Several radiostations will be able to use one wave-length without risking to interfere with each other.

CSO: 5500/1036

AGENCY ACCEDES TO DEMANDS TO ALLOW RECEPTION OF SATELLITE TV

Industry, Viewers Fought Restrictions

Copenhagen BERLINGSKE TIDENDE in Danish 17 Nov 83 Sect III p 3

[Article by Michael Rastrup Smith: "Radio Industry at War with Postal and Telegraph Service Regarding Satellite TV"]

[Text] Relations between the radio industry and the Postal and Telegraph Service are becoming constantly more strained. The poor relations are due to P & T's [Postal and Telegraph Service's] zealous attitude toward the fact that Danish firms in the radio industry are gaining experience from and are demonstrating satellite TV. P & T's attitude is in sharp contrast to relations in our neighboring Scandinavian countries.

Antenna firms in Denmark feel themselves exposed to especially heavy-handed treatment by the Postal and Telegraph Service, which is described as unreasonable, rude and bureaucratic.

While both Norway's and Sweden's telecommunications agencies have a relaxed attitude toward the fact that antenna firms are conducting experiments with satellite TV and are demonstrating their products at fairs, the Danish Postal and Telegraph Service is acting stiffly.

Assistant Director J.N. Palle of Philips Radio A/S says:

"We have a parabolic antenna sitting on the roof. It is designed for receiving satellite TV. However, we cannot get permission to show satellite TV to our customers in our demonstration room. I feel this treatment on the part of P & T to be unreasonable and am anxiously waiting for the court decision in the case in which the Luxor firm is being required to pay a big fine for having demonstrated satellite TV."

"I have practically had it with P & T. They are treating us very poorly and bureaucratically," Director Jens Hokland of the Stofa antenna firm in Horsens says. "We asked P & T in writing a year ago for permission to receive satellite broadcasts from English 'Satellite Television' in our laboratory. In spite of several repeated requests they have not answered us yet. We do not understand this attitude, for we have both the permission of the EUTELSAT

European Satellite Union and 'Satellite Television's' permission to receive the program. If a change in P & T's attitude does not take place very soon I am ready to act alone."

#### Cold Shoulder

Danish firms which have wanted to demonstrate satellite equipment at radio fairs have received a very cold shoulder from the Postal and Telegraph Service. P & T struck immediately in this way last year when the Luxor Radio A/S firm demonstrated a Russian TV program via the Gorizont-1 satellite.

However, Luxor was found not guilty in Århus Municipal Court. The case was appealed to the Western High Court, which is discussing the case at the moment. In spite of the acquittal in Århus Municipal Court, P & T struck again recently when Luxor demonstrated satellite reception at Magasin [department store] in Copenhagen. The equipment was seized.

With the confiscated equipment P & T has now undertaken to prove that illegal broadcasts could be listened to. By setting Luxor's satellite receiver equipment up in P & T's transmitting tower in Borups Alle [Avenue] it was possible to receive a picture from the radio link between Copenhagen and Malmø. An irrelevant test, Luxor says, and points out that it is impossible to avoid receiving something in a receiver when it is placed right next to a powerful transmitter.

The radio and TV industry is not exposed to this kind of investigation with ensuing court proceedings in our neighboring Scandinavian countries. In Norway, Steinar Helbø, who is technical director of the Janco antenna firm, which with the government's permission supplies almost 200,000 Oslo residents with satellite TV, says:

#### No Trouble in Norway

"Denmark is absolutely the strictest country in Scandinavia. Here in Norway antenna firms can get permission without any trouble for receiving satellite TV. It also goes smoothly when demonstrations at fairs and the like are concerned. In such cases permission is given automatically for the demonstration period."

"In addition, I do not understand the difficulties of Danish firms' receiving permission for receiving satellite TV for laboratory use. There is nothing at all in international regulations which prohibits this kind of thing."

In the Swedish Ministry of Education, under whose jurisdiction satellite TV comes, Lars Marian says:

"Parliament has already for a long time had a positive attitude toward Swedish firms' receiving satellite TV so that they in this manner can have an opportunity to gain experience in satellite equipment."

In Sweden any citizen can freely receive what he wants to on radio and TV. Thus there is no prohibition against receiving satellite TV, provided it is not retransmitted to others. This takes place anyway in Sweden in a number of cities, where the Russian Gorizont-1 satellite's TV programs are broadcast via antenna equipment in common. However, the authorities have elected not to intervene in this retransmission.

The Swedish Telecommunications Agency also does not arrive and confiscate when satellite TV is demonstrated at fairs and exhibitions. On the contrary, the Telecommunications Agency itself is busy with demonstrating TV from Gorizont-1 to exhibition guests at radio and TV exhibitions.

While the Norwegian and Swedish public have ample opportunity to become acquainted with satellite TV, which in a short time will become part of our everyday life, and while firms in these two countries are gaining experience with the new technology, P & T continues to come down hard on firms which want to gain experience and demonstrate the medium in Denmark:

Engineer O. Sveistrup, chairman of the antenna section of the Radio and Electronics Wholesalers Association, says:

"It surprises us professionals that P & T is acting so restrictively and rudely as it is doing. We do not at all think that P & T has a right to meddle in a firm's receiving an ordinary TV program from a Russian satellite. For the same reason we have an uncomprehending attitude toward P & T's legal proceedings against Luxor Radio A/S."

#### Lost Patience

The Radio Industry Joint Council is also about to lose patience with P & T. In a leading article in the RADIOBRANCHEN [RADIO INDUSTRY] periodical, which is the mouthpiece of the combined radio industry, the following has been written:

"It has always been the industry's policy to maintain good relations with the authorities, which we naturally have to deal with in daily life. This concerns the Postal and Telegraph Service."

"It concerns DR [Radio Denmark] and it of course also concerns the remaining authorities. But especially DR and P & T."

"Unfortunately, cooperation with P & T has been strained because of what we all regard as a petty and uncommitted attitude toward one problem which to an increasing degree will become both P & T's and our world's."

#### Agency Gives Up Opposition

Copenhagen BERLINGSKE TIDENDE in Danish 30 Nov 83 p 3

[Article by Michael Rastrup Smith: "Permission to View Satellite TV"]

[Text] A short time after the chairman of the Folketing Public Works Committee, Helge Dohrmann, and Conservative Finn Jørgensen announced that they wanted to send for the minister of transport for consultation in the committee because Danish electronics firms could not get permission to view TV from satellites, a solution to the problem is now at hand.

Now Danish electronics firms may indeed receive TV programs from, among others, the ECS-1 satellite, which in a short time will broadcast "Satellite Television." P & T has complied with the sharp criticism of the practice employed hitherto.

The Danish electronics firms which recently complained that P & T did not permit them to receive programs from TV satellites in their laboratories will not have problems henceforth.

Until now Danish electronics firms have only been able to receive purely technical signals from satellites which broadcast TV, while they were not able to get permission to receive the pictures themselves from these satellites. This practice will now be changed.

General Director Hans Würtzen of the Postal and Telegraph Service reports to BERLINGSKE TIDENDE that they are now willing to give permission to firms involved in development of satellite equipment so that they can receive both technical signals and pictures.

According to P & T's general director, it was not due to reluctance on the part of the Telecommunications Administration that firms previously were not able to view pictures from the satellites. But P & T hitherto did not have arrangements with foreign telecommunications administrations regarding Danish electronics firms' being able to receive pictures from satellites.

"However, we have just negotiated an agreement with the English telecommunications agency British Telecom. This means that Danish firms working with satellites can join in watching the 'Satellite Television' program for the future," Hans Würtzen says, who emphasizes that for the future P & T has a very positive attitude as far as the extension of laboratory experiments is concerned.

#### Satellite TV Legislation Being Readied

Copenhagen BERLINGSKE TIDENDE in Danish 2 Dec 83 p 2

[Article by Michael Rastrup Smith: "Fundamental Decision Regarding Satellite TV"]

[Text] The High Court has decided that it is prohibited to show satellite TV at radio fairs. However, it is a question of time before it becomes legal to see satellite TV. Legislation is on the way.

The satellite case has found its conclusion for the time being. There is no legal authority to demonstrate foreign satellite TV in Denmark, the Western High Court says.

After having been acquitted in Århus Municipal Court, the Luxor Radio A/S firm and a local Århus radio dealer received a fine of 1000 kroner each. The prosecution had demanded a fine of 10,000 kroner.

The judgement is of great fundamental significance, for there is now a court decision to the effect that it is not permitted to view TV from a communications satellite.

However, it is a question of how long the judgement will be allowed to stand. There is an amendment on the way from the minister of transport which will make it possible to join in peeking at foreign satellites. The idea is that the Postal and Telegraph Service will receive the signals and distribute them in the future hybrid network.

If the High Court had affirmed the acquittal of Luxor and the local dealer in Århus it would in principle have meant that all Danes could completely legally watch satellite TV. A judgement of not guilty would thus in a decisive manner have overtaken the minister of transport's planned legislation from the inside.

However, the court concluded that the equipment which had been used for the demonstration was illegal because in addition to normal satellite TV broadcasts it can also be used to receive signals which are not ordinary radio broadcasts.

However, a shortwave radio can do this, too, for it is possible to listen to confidential correspondence in between bands with normal radio broadcasting. For example, radio conversations over Lyngby radio, conversations with planes, etc.

However, this kind of radio is not illegal, for P & T characterizes it as a historical tradition from wartime that people are to be permitted to possess this kind of radio.

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CSO: 5500/2554

## BRIEFS

AGENCY SURRENDERING TERMINALS MONOPOLY--The National Postal and Telecommunications Administration is waiving its monopoly of telecommunications terminal installations, and next year customers will be able to purchase equipment from others as well, provided that the P & T Administration approves the types of terminals. Terminal equipment for telex and teledata services will be surrendered to the free market starting next year. The general telex instruments will be optionally available by 1986. The agency is continuing its presence in the market with terminal rentals and maintenance contracts for equipment it handles. A spokesman for the agency claims that the decision will allow the agency to concentrate on a line of top-quality instruments. The rule is that terminals connected by modems can be owned by the subscribers. This also frees certain permanently connected terminals for use on special terms. [Text] [Helsinki HUFVUDSTADSBLADET in Swedish 9 Nov 83 p 14] 9992

CSO: 5500/2552

## CNET RESEARCH IN SILICON IC'S, SEMICONDUCTORS, EPITAXY

Paris TELECOMMUNICATIONS in French Oct 83 pp 31-39

[Article by Michel Dubos and Daniel Paquet: "The Electronics Sector"]

[Excerpts] The electronics sector involves more than just systems. It involves high-level technological research relentlessly carried out to achieve the national objective of reconquering the domestic market.

Electronic components account for an increasing proportion of telecommunication systems. Quantitatively, integrated circuit sales on the telecommunications market will rise from 580 million francs in 1980 to 2 billion in 1985, i.e. approximately 40 percent of the domestic market. In addition, the new optical fiber transmission technology and the expansion of video and data communications will require massive quantities of new components: semiconductor lasers, optical modulators and photosensors on the one hand, flat-faced display screens on the other hand.

In both respects, telecommunications will use the new technologies and are a notable partner of the "electronics sector" as defined by the Ministry of Industry and Research as a result of the Farnoux report.

Components are a major segment of the electronics sector, and the segment whose market is most highly international: at present, this market shows a deficit and imports cover approximately 60 percent of the domestic market. As a result of this, several domestic projects were devised to coordinate the activities of public laboratories and ensure the transfer of research to the industry. In the field of components, we may mention four projects to which the CNET [National Center for Telecommunications Studies] is more or less closely associated: computer-aided design for very-large-scale integrated circuits (VLSI CAD); displays, especially flat-faced screen displays; computer-aided design and manufacturing (CAD/CAM), especially computerized production control for integrated circuits; the basic building blocks for mini and microcomputers.

In this article, we shall describe and illustrate the CNET research and realizations in the field of components which, as a whole, account for a considerable proportion of the national research effort in the "electronics sector": expertise in the silicon VLSI technology, research on III-V semiconductors (gallium ar-

senide, indium phosphide, etc.) and their use in semiconductor laser technology, and finally research on display components.

### Silicon Integrated Circuits

The CNET research on silicon integrated circuit manufacturing technologies is concentrated at the Grenoble Center (Norbert Segard Center), created in 1977 with the mission of "increasing the national research and development capacity in all fields of microelectronics, to enable France to make up for the ground it has temporarily lost and then keep itself up at international level."

An easy way to describe the CNET research is to follow the various stages leading from the initial idea of a circuit with given specifications to the actual production of the component.

The first stage, the architecture, involves breaking down the circuit function into elementary functions and testing their logical feasibility by building a functional model using discrete components available on the market. The next stage is to design the integrated circuit proper. Because of the complexity of VLSI circuits (a few tens of thousands of transistors on a silicon chip), they can be designed only with the aid of computers: the CNET has developed an original system, called Cassiopee, which is "an integrated CAD system for highly-integrated circuits." Using the indispensable CAD, the circuit is designed in three steps: (1) the logical diagram of its functions is prepared; (2) its symbolic diagram is established, i.e. a drawing of the circuit is made showing its discrete components (transistors, passive components, connections) and their location on the chip, and minimizing the number of connections; (3) the circuit itself is laid out, and the masks to be used in the actual manufacturing of the component are prepared. The final product of the design stage is a magnetic tape that contains all the data required to control the machines that will produce the masks.

The next stage is the material realization of the circuit. Its principle is extremely simple. The dopants are diffused or laid out, the contacts oxidized and laid down. To this end, the CNET has a pilot plant whose heart is a white room. The silicon chip is coated with a resin which is exposed to ultraviolet light or to an electron beam, through the mask. The exposed resin is then eliminated by chemical, ionic or electronic etching, revealing the chip areas that will be used for diffusion, oxidation or deposition. This pilot line provides support to all the research on manufacturing technology: research on electron-beam microlithography, plasma or reactive ionic etching, plasma-surface interactions, resin development, the interpretation of physical phenomena occurring in nitrides and silicides, etc.

Once the finished product has been resin-encapsulated, its characteristics must be determined as thoroughly as possible. First, its macroscopic operation is tested: electric characteristics, logic responses. For that, an original system was devised: it provides a direct display of the circuit electric state and uses subnanosecond electron stroboscopy. Local characteristics of the component (diffusion profile, electronic or crystallographic defects, etc.) can also be determined using a whole array of techniques: X-rays, scanning electron micro-

scope, etc. Finally, as an indispensable complement in understanding and improving local electric characteristics, mathematic models can be used to assess the technologies.

What kinds of circuits and technologies are studied at the CNET? Based on the knowhow and expertise acquired through the realization of a 4-kbit NMOS [N-channel metal-oxide semiconductor] memory, the CNET has developed an NMOSL3 system which has now been validated for a circuit of a design grid-width of 3 microns including a test area with 0.8 grid-width elements. Simultaneously, significant results were obtained with an analog CMOS [complementary metal-oxide semiconductor] system with a grid width of 4 microns, and in STCMOS (i.e. stacked transistor CMOS) technology. Among the circuits realized or under study, we should mention a signal-processing microprocessor consisting of some 70,000 transistors, a digital-filter encoder-decoder (12,000 transistors) and an 8-Mbit/second transmission-speed communicating circuit.

The CNET research on silicon technology has generated products that can be transferred to the industry. First, software: the Cassiopee VLSI CAD system, which we already mentioned, and the Basil system, which is a new data-processing CAM tool used in the pilot plant to record chip-manufacturing data. The CNET is also developing manufacturing and characterization machines, in particular an ellipse-meter and a laser marking machine for silicon chips.

The Grenoble CNET was given guidelines whose main objective is the development of a technology that could be transferred to the industry by the end of 1986 and would make it possible to produce the circuits which the telecommunications will require before the end of this decade. This technology will have to be the state of the art worldwide at the time and will include: a high-speed logic CMOS part with a submicron channel length, an analog CMOS part with switched capacitors, and a bipolar part for inputs-outputs.

### III-V Semiconductors

Research on the physical properties of III-V compounds and the development of optoelectronic and microelectronic technologies using these compounds is carried out essentially at the CNET Bagneux laboratory (in the Paris area) and at one of its Lannion centers in Brittany.

A III-V compound is a structure consisting of all or some of the following elements: a massive monocrystalline substrate, one or several thin layers with thicknesses ranging from a few fractions of a micron to a few microns, and contacts. The substrate is a conductor or an insulator. It can be passive and is then a mere support; in the area close to the interface, it can also be the seat of the effect brought into play.

Several materials are being investigated: GaP which is used for the industrial production of green electroluminescent diodes; GaAs, InP and GaSb whose emission wavelengths, respectively 0.87, 0.95 and 1.65 microns, represent very interesting regions for fiber optics (where attenuation minima occur around 0.85, 1.3 and 1.6 microns). In addition, all three compounds outrank silicon when it comes to electron mobility. Actually, the two technologies studied at the CNET use either GaAs or InP as substrates.

With GaAs semiconductor lasers, continuous operation at room temperature is possible only if the active GaAs zone, in which the laser effect occurs, is surrounded by two forbidden-band regions higher than that of GaAs: the charge-carriers injected into the active GaAs zone must be enclosed in a potential trough. The condition of compatibility of crystalline parameters of adjacent materials restricts the choice of the latter. To realize GaAs heterostructures, AlAs is the only compound with a crystalline parameter sufficiently close (GaAs: 5.65 angstroms, AlAs: 5.66 angstroms). To make the parameter gap still narrower, the material selected is an alloy:  $\text{Ga}_{1-x}\text{Al}_x\text{As}$  where  $x$  ranges from 0 to 1. The value given to  $x$ , in practice 0.3, is the smallest value compatible with an adequate height of the potential trough.

We are therefore witnessing the emergence of a new family of III-V alloys. The properties of these ternary alloys vary continuously with the composition  $x$ ; this is especially true of their mobility, forbidden-band energy, refraction index, crystalline parameter. In the case of the GaAs-GaAlAs laser, the potential trough formed by the active zone where photons are created by the electron-hole recombination corresponds to a region with a refraction index higher than in the adjacent layers. Thus, like the injected carriers, the photons are confined in the same very small volume, which makes it possible to achieve a very effective carrier-photon stimulation. The laser emission wavelength can be varied by modifying the composition of the active layer and adjusting it accurately to a fiber minimum attenuation.

When InP is chosen for the substrate, the laser active layer is formed of a quaternary alloy,  $\text{Ga}_{1-x}\text{In}_x\text{As}_{1-y}\text{P}_y$ . With such a material, it is possible to obtain both the desired wavelength and the parameter agreement. The maximum wavelength is obtained with  $\text{Ga}_{0.47}\text{In}_{0.53}\text{As}$  and is close to 1.6 microns, which corresponds to the absolute minimum of optical fiber attenuation. The wavelength of 1.3 microns, for which silica dispersion is nil, corresponds to the composition  $\text{Ga}_{0.29}\text{In}_{0.71}\text{As}_{0.62}\text{P}_{0.38}$ . Lasers emitting at either of the two wavelengths are now being optimized at CNET.

Therefore, microoptoelectronics associating optical and electronic components must be based on the GaAs-GaAlAs system at 0.85 micron, and on the InP-GaInAsP system beyond 1.3 microns.

The properties of GaInAsP alloys are still not well known and much work remains for the physicist: to measure the physical properties of the material, determine and understand how they are affected by the alloy effect. In the GaAs and InP binary compounds, the Ga, In and As, P atoms are arranged in a regular crystal lattice. However, in the alloys, the Ga and Al atoms of GaAlAs, and the Ga and In or As and P atoms of GaInAsP present a certain microscopic disorder. Does this disorder have any effect on macroscopic properties? To improve its knowledge of the vital part played in applications by impurities and defects in these materials, the CNET uses various methods: luminescence, optical absorption, Raman and Brillouin effects, conductivity, Hall effect, capacitive methods, X-rays, electronic microscopy, Castaing's probe, etc.

As we just saw, the III-V alloys offer a wide range of properties that can be adjusted by modifying the compositions. By making wise use of the hetero-

structure, it is possible to obtain a whole range of optical and electrical properties (ultrarapid bipolar heterojunction or field-effect transistor, phototransistor, etc.). From a still basic point of view, the possibility of stacking up very thin (a few tens of angstroms) alternating layers of two materials having different forbidden-band energies to form supernetworks will generate materials that are still unusual and whose properties are just beginning to be actively studied, especially at the CNET.

A vital point in III-V devices is that the thin layer or layers deposited on the substrate must be done with extreme care. The technique used is called epitaxy. Various methods can be used with III-V materials: liquid epitaxy, vapor epitaxy, molecular-jet epitaxy; all three are used at the CNET.

Molecular-jet epitaxy is a different and more recent method of forming epitactic layers that are well adapted to III-V compounds. It consists in evaporating the elements separately under ultravacuum so as to obtain the desired layer composition. The composition is checked in situ by a mass spectrometer. The crystal quality can be tested during growth by electronic diffraction, and the presence of residual impurities can be detected by Auger spectrometry. This is a sophisticated method which is very interesting, in particular to deposit very thin layers (up to a few angstroms), and very promising as far as integration is concerned. The method was used at the CNET to realize lasers and electro-optical switches, as III-V materials also possess good electro-optical properties.

Among the latest CNET realizations, we should also mention the integration into a single component of two GaAs/GaAlAs lasers emitting on two distinct wavelengths (0.850 to 0.885 micron) and that can be modulated separately. The beams emitted can be coupled to a single multimode optical fiber to achieve an "optical multiplexing." To achieve this, specific dual heterostructures were realized by photoengraving and epitaxy recovery: the composition of the active layer varies periodically in the growth plane parallel to the cleavage surface. The two lasers, 25 microns apart, emit independently from each other in their basic transverse modes. The best thresholds obtained in the pulse mode were 45 mA and 65 mA. However, there is a slight diaphony (of the order of -20 dB) between the two signals emitted; it appears to be of thermal origin.

#### Display: Flat-Faced Screens

Two different technologies are now being studied at the CNET. The first one uses the electroluminescence of the  $Mn^{2+}$  ion in a polycrystalline ZnS matrix deposited by vacuum evaporation. The system is supplied low-frequency alternating current. The threshold voltage is rather high (100 effective volts or so).

Many parameters (layer thickness, dielectric constants, breakdown voltage) and physical phenomena that are still not well known (charge compensation, ion migration) will affect the luminance-voltage characteristic; they are actively studied and progressively brought under control. An intrinsic memory effect that considerably simplifies the matrix-control electronics was found to exist, as well as the possibility of obtaining half-tones.

Other dopants (rare earths) can be introduced to generate additional colors. A feasibility model was built; it makes it possible to obtain a 26 x 26 [cm] display in increments of 1.27 mm.

The other technology studied uses liquid crystals in the nematic phase in the so-called "helicoidal nematic" configuration associated to an active matrix control consisting of a thin layer of transistors deposited on a glass plate. These transistors, whose structure is very much like that of common MOS field-effect transistors, are made of hydrogenated amorphous silicon. This is a very inexpensive material and few masking operations are required to make the transistors. Contrary to the devices commonly used in watches or pocket calculators, transistors will induce a very sharp threshold effect; the result is good visibility and improved contrast. This device requires alternating currents of a few volts and could broadcast images at the same rate as television.

In closing, we should mention that the CNET is carrying out research of a far more exploratory nature on electrochromic readouts: electrochemical reactions can be used to make readouts when they are reversible and accompanied by an optical effect. The substances studied at the CNET are lutecium diphthalocyanine, which turns from green to red or purple, and methylene blue which is colorless and turns blue after oxidation. The attractive appearance of the display obtained is due to the rather good contrast and the wide angle of visibility. These devices also have a memory; however, erasing is time and energy-consuming. These processes are not yet sufficiently under control to yield a component that could be used industrially.

This brief panorama of the CNET research shows that the CNET plays an important part in the electronics sector as far as components are concerned: silicon and III-V microelectronics, microoptoelectronics, flat-faced screen displays. It is important to note that this research requires large investments in heavy equipment (white rooms, electronic masking device, epitaxy stands, CAD data-processing support) and in characterization equipment. We should also point out that, parallel to technological research and closely related to it, more fundamental research in solid-state physics is carried out at the CNET in collaboration with university laboratories, the National Center for Scientific Research and the industry to prepare components for the day after tomorrow.

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CSO: 5500/2558

## FIRST CONTRACT SIGNED FOR FRENCH FIBER OPTICS NETWORK

Stockholm NY TEKNIK in Swedish 3 Nov 83 p 7

[Article by Miki Agerberg]

[Text] Montpellier--Last week the mayor of Montpellier signed a contract with France's minister of telecommunications for covering a large portion of that city with a network of fiber optical cables for the transmission of TV programs and other information to Montpellier's inhabitants. This is the first contract to be signed as part of the grandiose French cable plan.

In November 1982, the French Government adopted a plan for quickly covering the country with a network of fiber optical cables. By the end of 1986, nearly 1.5 million households will be hooked up to the cable network, after which expansion will continue at a rate of 1 million households per year.

To begin with, the network will be used mainly for distributing cable TV. But new and more revolutionary possibilities will open up later on.

Last week's contract means that Montpellier, a city the size of Malmo that is the capital of a region in southern France, is the first municipality to be given the green light to pioneer the new cable network. The cable installations decided on previously--in Biarritz, for example--are experimental in nature.

The contract was signed when Louis Mexandeau, minister delegate to the minister of industry and research for post and telecommunications, visited Montpellier to open a conference on the cable network and video communications.

A distinctive feature of the French cable plan is that the individual municipalities must take the initiative and request a cable network. The central government then selects those that can begin (the central government pays the largest share of the investment).

### Local Interest

There is great interest among local politicians, says Ghislene Chargros of the French Postal and Telecommunications Administration. So far about 100 municipalities have applied.

The French plan also means that the central government has a monopoly on building the cable network.

Louis Mexandeau explains: "I don't intend to let private firms skim off the cream of the market with imported equipment.

"It is certainly profitable to install cable networks in the big cities. The government monopoly is needed to ensure that rural areas and poor municipalities also have access to the cable network."

The government has great visions concerning the possible cultural significance of the cable network. And at the conference in Montpellier--sponsored by the IDATE (Telecommunications Research Institute)--there were plenty of airy outlines of ideas about "interactive audiovisual communication" in the future.

#### Ideas Lacking

But specific and sturdy ideas about what the new channels will be filled with were in shorter supply. Program producers and the programming industry were sparsely represented at the conference. And today's French TV is not known for being especially exciting.

Jack Lang, minister delegate to the prime minister in charge of culture, has recently taken a number of steps to improve the situation. New organizations have been established and more money is being shaken loose to support the French culture industry.

What effect that may have remains to be seen. The desire is to avoid at all costs a situation in which, as one participant in the conference expressed it, "we build expressways that will be used chiefly by foreign automobiles."

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CSO: 5500/2547

FRENCH FIBER OPTIC NETWORK TO BE LAID NEXT YEAR

Stockholm NY TEKNIK in Swedish 10 Nov 83 p 7

[Article by Miki Agerberg]

[Text] Video telephones, teletext, cable TV and stereo sound--that is what 1,500 households and businesses in the French city of Biarritz will be supplied with as part of a big experiment aimed at investigating the future possibilities of optical fibers.

But the regular network of fiber-optic cables that will soon start to be laid down in France is nowhere near being equally advanced.

In about a year, the first cables will be laid as part of a big project for quickly covering France with a network of fiber-optic cables.

For the users, the only result at first will be the ability to pick up more channels on their TV sets.

For example, the plan for Montpellier, the first city chosen to participate in the new cable network (see last week's NY TEKNIK), calls for the following:

The three French TV channels that already exist, the new fourth channel, which will be pay TV with an emphasis on feature films, a couple of foreign channels (Great Britain's BBC and Catalan TV from Spain), future French-language satellite TV, and local programming.

The plans being reported from other cities are about the same, and that is not so strange. The fiber-optic network that is to be built will be relatively simple in design and will not provide many more services than cable TV (up to 15 channels).

So why is the French Government choosing such an advanced technology as fiber optics just to expand cable TV?

Part of the answer is that it wants to give French industry a boost in a promising high-tech area of the future.

Another reason is that in the future, it will be possible to use fiber optics for much more than cable TV.

The testing of some of those possibilities will start soon as part of the experiment in Biarritz.

Biarritz is a popular seaside resort on the Bay of Biscay near the Spanish border. A suitable spot for demonstrating advanced technology, decided former President Giscard d'Estaing as early as 1979, when he picked Biarritz as the proving ground for fiber optics.

That is where the possibilities of fiber optics in so-called interactive systems will be tried out. To put it simply, the TV set is to be combined with the telephone.

The 1,500 subscribers participating in the experiment (households, stores, and offices) will each be supplied with a newly developed video telephone terminal to go with the TV set. It consists of a small TV screen with a telephone receiver on one side, a video camera on the other, and a keyboard underneath.

With that equipment, one can see the person to whom one is talking on the telephone. Or one can disconnect the camera and transmit something besides one's own picture: for example, pictures of one's cat or an interesting document.

By attaching an additional keyboard, one can also use the video telephone terminal to receive teletext.

One can choose between as many as 10 different TV channels.

For an extra fee, the user can get an additional TV set allowing him to watch another of those channels at the same time, as well as a stereo receiver.

The cable network in Biarritz is more sophisticated and considerably more expensive than the standard network that will cover France. Each subscriber in Biarritz will be connected to two fibers, and in all, 9,500 km of fiber will be used.

"The services we are starting with in Biarritz are just a beginning," says project manager Michel Dupire. "As the experiment continues, new applications will be added."

#### Startup in 1984

The first subscribers in Biarritz will be hooked up at the start of 1984. The experiment there will be a test of possible future paths of development for fiber optics in France. If the decision is made later to invest in that type of service on a larger scale, part of the heavy work and investment will already be out of the way, since the simpler cable network now being set up will already be in place.

The question is: how much interest really exists on the part of the public? The 1,500 test subscribers in Biarritz are to be recruited on a voluntary basis. So far, only a little over half that number have signed up.

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## BRIEFS

INMARSAT COOPERATION--MATRA is going to cooperate with Hughes Aircraft (American) and British Aerospace in answering the call for bids recently sent out by the international maritime organization INMARSAT for a new generation of communications satellites designed for the merchant marine, announced British Aerospace. An agreement of this kind has just been concluded between the British and American companies and SATCOM INTERNATIONAL, a company with which MATRA and British Aerospace have already worked in constructing EUROSTAR, a platform designed for launching several satellites, including the French ATHOS, thanks to the ARIANE 4 rocket. [Text] [Paris AFP SCIENCES in French 27 Oct 83 p 32] 12368

CGE-THOMSON COORDINATING COMMITTEE--The nationalized groups CGE and Thomson, which recently decided to realign their activities so as to give CGE the lead in telecommunications, have created a coordinating committee. This committee is in charge of seeing to it that "all steps are taken to ensure optimal overall efficiency of the human, technical, and commercial resources" that will be pooled. This body, which will meet once a week, is co-directed by George Pebereau, managing director of CGE, and Alain Gomez, general manager of Thomson. It will also prepare, next January, the constitution of Thomson Telecommunications, which will progressively be taken over by CGE. [Text] [Paris AFP SCIENCES in French 10 Nov 83 p 27] 12368

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ICELAND

AGENCY EXPECTS TO ESTABLISH NATIONAL COMPUTER NET BY 1985

Reykjavik MORGUNBLADID in Icelandic 11 Nov 83 p 32

[Article: "Public Computer Net To Be Established in Iceland in 1985"]

[Text] The Icelandic Ministry of Communications has requested seven companies to submit proposals for the establishment of a public computer net or informational exchange system in Iceland. In connection with this, Thorvardur Jonsson, chief specialist in the Ministry of Communications, made a statement at a conference of the Icelandic Management Company and Icelandic Data Processing Technology Company yesterday on "The Office of the Future."

Jonsson said that six companies had made proposals and that they were being considered by the Ministry of Communications. "If there are not cut backs we will soon be making an agreement in this area with one of the companies with the intention that work will be underway by the end or 1984 and beginning of 1985 and the system ready for use by mid-year 1985," Jonsson continued.

Plans are that a main facility with 140 inputs will be established in Reykjavik and later facilities with 20 inputs each at Stykkisholm, at Isafjordr and Blonduos. There will be facilities at Aukureyri and at Egilsstadir with 35 inputs at each site and finally a facility at Hvolsvollur with 30 inputs, or for a total of 300.

Jonsson said that according to the conclusions of the Ministry of Communications, it is apparent that large scale users in Iceland plan to use between 100 and 110 inputs. It is, however, still unclear how the net will be used. If demand grows, the net will be expanded rapidly later.

From what Jonsson said, it was clear that the plan is to establish connections with computer nets in the United Kingdom, United States and the Scandinavian countries and through these systems it will later be possible to establish connections widely in the world. In terms of the system as it is planned now, all Icelandic companies can be connected, wherever they are in Iceland.

When the computer net has been completed, it will be possible to transmit all computerized statements from whatever part of Iceland and also possible to transmit them between countries.

ERICSSON TEAMS WITH U.S. COMPANY FOR MARKET, R&D

Stockholm NY TEKNIK in Swedish 3 Nov 83 p 8

[Article by Erik Mellgren]

[Text] One of the largest information systems companies in the United States is going to sell L.M. Ericsson's new electronic PABX's. The firms will also cooperate in further development of those exchanges.

Honeywell, the seventh-largest information systems firm in the United States, will buy and resell Ericsson's new, completely electronic and digital PABX's. The agreement, which was signed in mid-October, covers both the United States and Canada. The firms will also establish a joint development company to be known as the Honeywell-Ericsson Development Company. By next year [1984], it will have about 200 employees.

Hakan Ledin of Ericsson Information Systems says: "We know that it is tremendously difficult to enter the U.S. market. At the same time, we want to be there to follow up on development."

Safety Net

Ericsson Information Systems is L.M. Ericsson's subsidiary for such things as data communications, office automation, and so on. Hakan Ledin was the firm's managing director until just recently, but he is now acting as chairman pending his move to the United States next summer as head of Ericsson's U.S. subsidiary.

Hakan Ledin says: "The agreement with Honeywell will serve as a kind of safety net for our efforts in the U.S. market. It is a way of gaining quick access to an established channel to an established customer base.

"Honeywell feels that the communications area will become increasingly important to it. But it does not want to develop its own PABX's. Instead, it wants to buy them readymade for connection with its own systems. At the same time, it wants closer cooperation with its supplier than is usually the case, and that is what led to the joint development company."

## Biggest Agreement

The development company will be responsible for further development of the PABX known as the MD110 for the American market. It will also work with Ericsson's computer network, ERIPAX.

The agreement with Honeywell will be worth approximately 500 million kronor over the next few years. That makes it the biggest cooperation agreement ever concluded by L.M. Ericsson.

Ericsson Information Systems will also sell the MD110 on the American market independently as well as through Honeywell.

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# SWEDISH TELE-X MAY BE OBSOLETE, SUPERFLUOUS WHEN LAUNCHED

Stockholm NY TEKNIK in Swedish 10 Nov 83 p 8

[Article by Anders Wallerius]

[Text] Tele-X, the Scandinavian TV satellite, will be launched 3 years from now. Sweden has invested over 1 billion kronor in that giant industrial project.

But it may turn out to be a gigantic investment failure before it even reaches space.

Realities have changed faster than anyone expected, and Tele-X may be obsolete before it is even launched.

"Technical and economic developments have altered the situation for satellite TV," says Bertil Thorngren, head of group planning for the National Telecommunications Administration.

There is no longer any talk about direct satellite TV and a parabolic antenna on every house. Instead, the emphasis all around Europe is on developing the cable TV network.

According to plans, two-thirds of all European households will be connected to the cable system within about 10 years. This means that powerful satellites like the Tele-X will not be needed. The ECS [European Communications Satellite] will be completely sufficient, says Thorngren.

He says: "There is now a big market for transmitting programs all over Europe. And it is relatively simple today to receive transmissions from the ECS."

## Cable TV Instead

The National Telecommunications Administration is certainly involved in the Tele-X project, but it is more interested in establishing a nationwide broadband network for cable TV and other things. It is also part owner of the ECS, which will supply the cable TV systems with programs.

Karl-Erik Eriksson, who is the National Telecommunications Administration's representative at EUTELSAT, which owns the ECS, says: "The market and international developments are changing at the moment."

He points out: "We must keep a very sharp eye on the changes in the rest of the world."

The ECS is a typical example of the shift. That satellite was designed originally to be a link in the transmission of programs among various TV corporations in Europe.

#### Ten Programs

But right after the new year starts, the ECS will begin sending European TV programs directly into viewers' homes. Anyone who has his own receiver or is connected to the cable TV system will be able to watch about 10 satellite TV channels from the ECS before the year is out.

According to plans, Tele-X was to be a "people's satellite" transmitting directly to households. A powerful transmitter would mean that all households could have their own parabolic antennas.

#### No Difference

Karl-Erik Eriksson of the National Telecommunications Administration says: "The difference between the two types of satellite is being wiped out."

He says: "The trend is toward adding a few watts to the transmitters in the second-generation ECS satellite."

A "strengthened" ECS satellite is completely sufficient even for the one-third of all households not reached by the cable systems.

From the technical standpoint, the ECS satellites covering Europe can do Tele-X's job. At the same time, they will offer dozens of TV channels from all of Europe's countries.

Despite that, Lars Backlund of the Space Corporation does not want to declare Tele-X officially dead. He is project manager for Tele-X, and he says it is still a proper investment.

Lars Backlund says: "We need a national counterweight to the international TV offerings."

He says: "It will take a decision on media policy to kill off Tele-X, and I don't think the politicians want to make that decision."

But in France and the FRG, those in charge are beginning to question the idea of direct-broadcast satellites.

## Plans Abandoned?

Both countries have projects which are equivalent to Tele-X and which have progressed equally far. It is true that they are going to launch the TDF-1 (French) and the TV-Sat (West German) in 1986, but what will happen after that is uncertain.

They may decide to abandon their plans for direct-broadcast satellites and invest instead in weaker satellites of the ECS type that will be combined with an expanded cable TV network.

"There has been a very clear shift in that direction in the international debate," says Bertil Thorngren of the National Telecommunications Administration.

"If there is no need for direct-broadcast satellites, we will have to meet the national demand for programming in some other way. Perhaps we ought to transmit local TV programs by cable instead," Thorngren suggests.

Karl-Erik Eriksson adds: "Whatever happens in the rest of the world, neither the National Telecommunications Administration nor the Space Corporation can ignore developments."

## Protection for Tele-X Disappears

All satellite TV programs in Sweden were to come from Tele-X. That has been the plan since the 1970's.

It was to be impossible for households to receive broadcasts from the other TV satellites--scrambling would see to that.

But last week the conditions changed all at once when Tele-X's most important protection disappeared. It was decided that transmissions from other satellites over Europe would not be scrambled.

The satellite organization representing Europe's various telecommunications authorities decided to allow TV transmissions via the ECS with no restrictions. As early as 1984, anyone who has a satellite receiver or a hookup with a cable TV system will be able to receive about 10 satellite channels entirely free.

The reason given for the decision is that a sufficiently good and cheap technology for effective scrambling does not exist. At any rate, it will not exist until 1985.

The truth is that EUTELSAT, the organization that owns the ECS, was subjected to blackmail by the countries that do not want their programs scrambled. Great Britain and the FRG want to broadcast their advertiser-financed programs to all of Europe without restriction.

Financing the programs with advertising is easier to administer than pay TV, in which the viewers pay for what they want to see.

It was the intention from the start that all ECS transmissions would be scrambled. Only viewers who had special descramblers and had paid fees to the programming firms would be able to watch European satellite programming.

Scrambling was a guarantee that we would not be awash in commercial programs and "cultural imperialism" from space.

Protected from the rest of the world, each European country would be able to pursue cultural ambitions in keeping with its own policy.

But commercial TV requires that as many people as possible see the commercials if advertisers are to be willing to pay for them. Scrambling would throw a monkey wrench into that plan.

Great Britain and the FRG threatened to drop out of the ECS program if they were not allowed to transmit their programs freely. The alternative is to lease space on satellites whose owners don't care what is broadcast or how, as long as they get paid.

EUTELSAT, which is a joint organization for 20 European telecommunications authorities, has invested a great deal of money in its own satellites. To keep the organization from splitting up, its members went along with unscrambled transmissions.

The Nordic countries, which had pushed the hardest to have ECS transmissions scrambled, are therefore losing control over what is offered on satellite TV. Now anybody who wants to can watch all European satellite channels.

Tele-X's protected environment has disappeared in one fell swoop. When Tele-X is launched 3 years from now, there will already be about 10 established satellite TV channels to compete with.

Presumably, it will be difficult to uphold Nordic culture on one channel in competition with 10 channels offering feature films, sports, entertainment, and news. Who is going to need Tele-X?

#### Background

The ECS is a telecommunications satellite owned jointly by 20 European telecommunications authorities through the organization known as EUTELSAT.

Each transmitter has an output of 20 watts, and the frequency is 11 gigahertz. A parabolic antenna with a 3-meter diameter is required to get a good picture. A receiver for the ECS currently costs about 30,000 kronor.

Tele-X is a telecommunications satellite owned jointly by Sweden, Norway, and Finland.

Tele-X carries three transmitters, two of which will be used solely for TV transmissions.

Each transmitter has an output of 230 watts, and the frequency is 12 gigahertz. A parabolic antenna measuring half a meter is sufficient for a good picture.

In mass production, a receiver will cost between 4,000 and 5,000 kronor.

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DIRECTOR OF TEXT-TV FIRM ASSERTS 'TRIAL PERIOD' OVER

Stockholm SVENSKA DAGBLADET in Swedish 10 Nov 83 p 22

[Article by Gorel Soderberg: "Text TV About To Become Our New Medium"]

[Text] "We have done a poor job of marketing our work. But this has been a trial period. I can say that starting this fall we will be going about it professionally. We've learned now how to manage this new mass medium."

Ake Holmberg, director of Text-TV, is talking about our latest mass medium. This is just what text-TV is going to be. In the beginning, the idea of text-TV was to help the deaf and hearing impaired, to enable them to get the news from TV and furnish them texts for programs. Today there are as many as 300,000 TV sets in the country that can receive Text-TV and next summer there are supposed to be 1 million.

200 Pages

"In the beginning, there were three of us working with text-TV," says Holmberg. "Today there are ten journalists and four text writers on our staff. We produce 200 text-TV pages that contain most everything from the latest stockmarket closing averages to the news, helpful hints for families, reports and background articles on major news events. Every day 50 to 60 pages of these are produced on news events.

Text-TV works by tuning in TV stations using the system. The pages of text-TV are always there, and the viewer himself determines when and what he wants to watch. Text-TV is as yet an anonymous branch in the big TV building at Gard.

"Since there were so few of us working with text-TV, we were of course unable at first to offer as many text-TV pages," says Holmberg. But the staff has grown in the 5 years we've been working at it, and the technology has improved. Today, we think we can handle it and we are turning more to the average TV viewer.

Until now, consumers have paid from 500 to 1,000 kronor more for a TV set with a built-in decoder for text-TV.

"Developments indicate that we soon will be paying the same price for TV receivers with factory-installed text-TV decoders," says Holmberg.

#### An Aid

Holmberg also realizes the "danger" of text-TV becoming a common consumer good.

"The idea behind text-TV, of course, is that it is an aid for the hearing impaired," he says. "There's the danger of forgetting that. But as long as I'm the director, it won't happen. We have an extremely good working arrangement with various organizations for the handicapped and also a good response from our readers. Working with text-TV, you cannot help becoming involved with other people and their need for what we're doing.

Today in our country, there are 3 million people who might be helped by text-TV. Of these, 1.2 million have impaired hearing.

"There are many people in Sweden who have difficulty in following a TV play, for instance. Immigrants form a large group. Retired people are another. When they have lines of text as a support, they have no problems in following the action.

Text-TV, then has additional missions: to produce independent text that viewers can "leaf" through when they wish and to furnish the regular TV programs with text. You cannot see the text on the TV screen unless you have text-TV and press the "text button." Then if you see the notice "text by text-TV" in the corner of the screen, you know that that program can be viewed with the text aid on a set equipped the text-TV decoder.

#### Color System For The Deaf

But the simple text is often not enough for the hard of hearing, Holmberg and his fellow workers realized. How is a deaf person to know who is talking in a film? And when there are only sound effects with no dialogue, how is this to be indicated?

"We simply tried out a system on our experimental group, which consists of 160 persons who are deaf or hard of hearing," says Holmberg. "Now we assign the various people in a film each a different colored dialogue text. When someone is lurking on the stairs, or a tree branch is tapping on a pane, we indicate that in the text, using a different colored format than for dialogue.

#### Writing Text Takes Time

It takes time to text a TV program. It takes about 5 workdays to text a 45-minute program. With text-TV's present work force, we can text three or four programs a week.

"We have also had success with live commentaries of, for instance, sports broadcasts, Nobel Awards ceremonies, etc.," adds Holmberg. "This is done with a new technique we worked out ourselves."

There is very much more for for text-TV to do, claims Holmberg. This is especially true if text-TV is regarded as "the new mass medium," and true enough if it remains simply an aid for the handicapped. They have begun to work with the deaf-blind in an effort to supply them with text-TV "translated" into braille.

"This class of handicapped considers the 'pages' we make to be sufficiently long and our news summaries to be just right," reports Holmberg.

#### Lots of News

For the general viewer, there are also local and up-to-date weather forecasts for the mountains during the winter months, as well as traffic information for European roads. In the works are news from our Scandinavian neighbors, whose own text-TV will produce the text and send it to Sweden.

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CSO: 5500/2552

## CHANGE IN BROADCAST LAWS SEEN AS RESULT OF ECS SATELLITE

Stockholm SVENSKA DAGBLADET in Swedish 16 Nov 83 p 22

[Article by Kerstin Hallert: "Satellite TV By Next Year"]

[Text] By next year satellite TV will become a reality in Sweden. Sweden is walking the path leading into tomorrow's media world with the experiments with cable TV being carried out presently in Lund and soon in Gothenburg, Jonkoping, Sundsvall and Skarpnack outside Stockholm.

The ECS [European Communications Satellite], will be placed in orbit by next year and will provide programs from eight different countries, partially in the form of pay TV, i.e., the viewer must pay a certain monthly fee.

At its latest board meeting, Swedish Radio proposed a change in broadcasting law that would make satellite TV possible in Sweden.

According to SVENSKA DAGBLADET's sources, the mass media committee meeting this Wednesday will not oppose the necessary change in the law. The Parliament and the Cabinet will then likely agree to introducing satellite broadcasts to Swedish cable TV on a trial basis.

### More TV Commercials

The experiments underway in Lund are by conventional surface cable. There, households can now receive Danish, West German and East German programs. West German TV commercials are part of the broadcasts as well. There will be even more TV commercials in satellite TV programming.

The coming ECS satellite will also include the broadcasts that are received now by cable in Norway, Finland and Switzerland from the OTS [Orbital Test Satellite] owned by newspaper mogul Robert Murdock. In the evening throughout the week, it now broadcasts sports, entertainment, family programs, full-length films and news.

The right to distribute satellite TV in Sweden is now so restrictive that the Sara hotel chain, which wanted to receive the OTS satellite broadcasts for its guests, has been discouraged by the Mass Media Committee from all such attempts.

## "Simulated Future"

Only a few weeks ago, the investigation into the free-speech facet cleared the way for the right in principle to broadcast television by cable in Sweden, i.e., cable TV was granted the same constitutional guaranty as the printed word. In June of next year, the Mass Media Committee will deliver its opinion on the qualifications of those applying for the right to distribute cable TV, i.e., the right to receive satellite TV.

The relaxed restrictions with respect to cable TV in Lund and the other areas involved in the experiments are due to the fact that cable TV in Sweden is presently, as they say, an experiment to simulate tomorrow's environment.

For the private cable-TV household wanting to receive broadcasts in Sweden from the ECS satellite, a small decoder will be needed to break the code in which the satellite broadcasts. In all of Europe, manufacturers are waiting for the starting signal as the huge decoder market opens up.

The mass media committee, recently returned from a study of satellite TV in London, observed that an increasingly crucial question is how much the cable TV market can bear when cable TV is expanded.

The ECS satellite will broadcast programs that are produced by companies that are controlled by national television enterprises.

## Ruling Party Split

Among those who are convinced that satellite TV is coming to Sweden to stay is Anders Biorck, Moderate member of Parliament.

"Sweden is conservative in matters of television. It is good that there are prospects for the ice to break up soon," says Biorck.

The minister of culture, Bengt Goransson, belongs to those who are showing great reservations at the prospect of free distribution of television.

The party in power is deeply split on the question of tomorrow's media situation.

In 2 years new satellites will be in orbit--the so-called people's satellites, that, unlike the communications satellites, will be aimed directly at households and require minimal receiving equipment in the form of a parabolic antenna.

TV sets have already been developed to receive the countless programs from the satellites. They will not cost much more than a color TV does today.

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